DOCUMENT RESUME

ED 141 417 TM 006 414

AUTHOR	Harris, Dale B.; Pinder, Glenn D.
TITLE	Goodenough-Harris Test Estimates of Intellectual Maturity of Youths 12-17 Years: Demographic and Socioeconomic Factors.
INSTITUTION	National Center for Health Statistics (DHEW), Rockville, Md.
REPORT NO	DHEW-HRA-77-1641; VHS-S-11-159
PUB DATE	Apr 77
NOTE	52p.; For related document, see ED 095 209
AVAILABLE FROM	Superintendent of Documents, U.S. Government Printing Office, Washington, D.C. 20402 (HE 20.6209:11/159, Stock Number 241-180:10, no price available)
EDRS PRICE	MF-$0.83 HC-$3.50 Plus Postage.
DESCRIPTORS	Academic Achievement; *Adolescents; Age Differences; Correlation; *Demography; Educational Background; Elementary Secondary Education; Family Income; Geographic Regions; *Group Intelligence Tests; *Intelligence Differences; Parental Background; Population Growth; Racial Differences; Scores; Sex Differences; *Social Differences; Socioeconomic Background; Statistical Data; Student Characteristics
IDENTIFIERS	*Goodenough Harris Drawing Test; *Health Examination Survey

ABSTRACT

The results of a modified version of the Goodenough-Harris Drawing Test are presented in relation to selected demographic and socioeconomic factors as they affect youths aged 12-17 years in the noninstitutionalized population of the United States. Findings are based on data gathered on a sample of 6,768 adolescents who participated in the Health Examination Survey of 1966-70. A consistent positive relationship was found between the level of parental education and the adolescents' test scores. An equally consistent positive association was observed between scores and family income. When either of these factors was held constant, the effect of the other persisted. Differences related to factors other than family income and parental education were negligible. The data did not reveal any significant data on differences among geographic regions, between urban and rural areas, or among racial groups which are not largely ascribable to socioeconomic status. Location of household with respect to city or suburbs was not significant, but rate of population change in the area of residence was associated with some small difference in performance. Differences in test performance--associated with school-related variables and academic achievement were considerably smaller than those observed for reading and arithmetic tests. In general, the test functioned as a general ability measure in the earlier years of adolescence, but after about age 15 it discriminated only in the lower reaches of the ability distribution. (Author/EVH)

Documents acquired by ERIC include many informal unpublished materials not available from other sources. ERIC makes every effort to obtain the best copy available. Nevertheless, items of marginal reproducibility are often encountered and this affects the quality of the microfiche and hardcopy reproductions ERIC makes available via the ERIC Document Reproduction Service (EDRS). EDRS is not responsible for the quality of the original document. Reproductions supplied by EDRS are the best that can be made from the original.

ED141417

VITAL and HEALTH STATISTICS

DATA FROM THE NATIONAL HEALTH SURVEY

Series 11 - No. 159

U S DEPARTMENT OF HEALTH, EDUCATION & WELFARE
NATIONAL INSTITUTE OF EDUCATION

THIS DOCUMENT HAS BEEN REPRODUCED EXACTLY AS RECEIVED FROM THE PERSON OR ORGANIZATION ORIGINATING IT. POINTS OF VIEW OR OPINIONS STATED DO NOT NECESSARILY REPRESENT OFFICIAL NATIONAL INSTITUTE OF EDUCATION POSITION OR POLICY

NATIONAL CENTER FOR HEALTH STATISTICS
NCHS

Goodenough-Harris Test Estimates of Intellectual Maturity

of Youths 12-17 Years:

Demographic and Socioeconomic Factors

U. S. DEPARTMENT OF
HEALTH, EDUCATION, AND WELFARE

Public Health Service

Health Resources Administration

2

Library of Congress Cataloging in Publication Data

Harris, Dale B.
Goodenough-Harris test estimates of intellectual maturity of youths 12-17 years.

(Vital and health statistics: Series 11, Data from the National Health Survey; no. 159) (DHEW publication; no. (HRA) 77-1641)

Bibliography: p.
Supt. of Docs. no.: HE 20.6209:11/159

1. Goodenough-Harris drawing test—United States—Statistics. 2. Intelligence levels—United States—Statistics. 3. Adolescent psychology—United States—Statistics. I. Pinder, Glenn D., joint author. II. United States. National Center for Health Statistics. III. Title. IV. Series: United States. National Center for Health Statistics. Vital and health statistics: Series 11, Data From the National Health Survey; no. 159. V. Series: United States. Dept. of Health, Education, and Welfare. DHEW publication; no. (HRA) 77-1641. [DNLM: 1. Intelligence tests—In adolescence. 2. Demography. 3. Socioeconomic factors. W2 N148vk no. 159]
RA407.3.A347 no. 159 [BF431] 312'. 0973s [153.9'324]
ISBN 0-8406-0068-0 76-608024

Data from the
NATIONAL HEALTH SURVEY

Series 11
Number 159

Goodenough–Harris Test Estimates of Intellectual Maturity

of Youths 12–17 Years:

Demographic and Socioeconomic Factors

Intellectual maturity of youths 12 through 17 years of age as measured by the Goodenough-Harris Drawing Test is discussed in terms of education of parent; family income; place of residence (size, type, and rate of population change); progress through school; race; and geographic region.

DHEW Publication No. (HRA) 77-1641

U.S. DEPARTMENT OF HEALTH, EDUCATION, AND WELFARE
Public Health Service
Health Resources Administration
National Center for Health Statistics
Rockville, Md. April 1977

NATIONAL CENTER FOR HEALTH STATISTICS

DOROTHY P. RICE, *Director*

ROBERT A. ISRAEL, *Deputy Director*
JACOB J. FELDMAN, Ph.D., *Associate Director for Analysis*
GAIL F. FISHER, *Associate Director for the Cooperative Health Statistics System*
ELIJAH L. WHITE, *Associate Director for Data Systems*
JAMES T. BAIRD, JR., *Acting Associate Director for International Statistics*
ROBERT C. HUBER, *Associate Director for Management*
MONROE G. SIRKEN, Ph.D., *Associate Director for Mathematical Statistics*
PETER L. HURLEY, *Associate Director for Operations*
JAMES M. ROBEY, Ph.D., *Associate Director for Program Development*
PAUL E. LEAVERTON, Ph.D., *Associate Director for Research*
ALICE HAYWOOD, *Information Officer*

DIVISION OF HEALTH EXAMINATION STATISTICS

ARTHUR J. McDOWELL, *Director*
JEAN-PIERRE HABICHT, M.D., Ph.D., *Special Assistant to Director*
HAROLD J. DUPUY, Ph.D., *Psychological Adviser*
LINCOLN OLIVER, *Chief, Psychological Statistics Branch*
ROBERT S. MURPHY, *Chief, Survey Planning and Developing Branch*

COOPERATION OF THE BUREAU OF THE CENSUS

In accordance with specifications established by the National Health Survey, the Bureau of the Census, under a contractual agreement, participated in the design and selection of the sample, and carried out the first stage of the field interviewing and certain parts of the statistical processing.

Vital and Health Statistics-Series 11-No. 159

DHEW Publication No. (HRA) 77-1641

Library of Congress Catalog Card Number 76-608024

CONTENTS

Introduction 1

The Health Examination Survey 1

The Test 2

Findings 2
- Raw Scores and Standard Scores 2
- Background Factors 3

Summary and Conclusions 10

References 11

List of Detailed Tables 12

Appendixes
- I. Technical Notes 32
- II. Demographic and Socioeconomic Variables and Related Terms 42

LIST OF FIGURES

1. Average T scores of youths 12-17 years of age on the Goodenough-Harris Drawing Test, by family income, education of parent, and geographic region: United States, 1966-70 4
2. Average T scores of youths 12-17 years of age on the Goodenough-Harris Drawing Test, by place of residence, family income, and education of parent: United States, 1966-70 4
3. Average T scores of youths 12-17 years of age on the Goodenough-Harris Drawing Test, by family income, education of parent, and rate of population change: United States, 1966-70 5
4. Percent of youths 12-17 years of age within each modal grade level, by selected demographic characteristics: United States, 1966-70 6
5. Percent of youths 12-17 years of age within each modal grade level, by selected socioeconomic characteristics: United States, 1966-70 7
6. Average T scores of youths 12-17 years of age on the Goodenough-Harris Drawing Test, by race, family income, and education of parent: United States, 1966-70 9

LIST OF TEXT TABLES

A. Correlation coefficients for person T scores with socioeconomic variables and their standard errors 3

B Comparison of the relationships of early school experience and relative grade level in school to scores of youths 12-17 years of age on the Goodenough-Harris Drawing Test, two Wechsler Intelligence Scale for Children subtests, and two Wide Range Achievement Test subtests: United States, 1966-70 8

C. Percent of youths 12-17 years of age who drew a figure of the same sex when asked to draw a "person," by race and sex, with associated standard errors: United States, 1966-70 9

SYMBOLS

Data not available	...
Category not applicable	. . .
Quantity zero	—
Quantity more than 0 but less than 0.05	0.0
Figure does not meet standards of reliability or precision	*

GOODENOUGH-HARRIS TEST ESTIMATES OF INTELLECTUAL MATURITY OF YOUTHS 12-17 YEARS: DEMOGRAPHIC AND SOCIOECONOMIC FACTORS

Dale B. Harris, Ph. D., *The Pennsylvania State University*, and
Glenn D. Pinder, [a] *Division of Health Examination Statistics*

INTRODUCTION

This is the second report to present data obtained from a modified version of the Goodenough-Harris Drawing Test administered during the Health Examination Survey of 1966-70 to a probability sample of noninstitutionalized youths 12-17 years of age in the United States. Statistical information provided in this report concerns the relationship of socioeconomic and demographic factors to intellectual maturity during the adolescent years.

It has been reported in a previous publication of this series[1] that, as an indicator of the level of intellectual maturity, the instrument discussed here is of less value in rating adolescents than in assessing development in younger children. The Health Examination Survey data demonstrated a leveling off of mean scores after early adolescence, such as had been previously demonstrated by Harris.[2] Nevertheless, there are two important reasons for presenting the information in this report: (1) the test appears to be an adequate measuring device for the younger three or four 1-year age groups in the population aged 12-17 years, and (2) these data demonstrate the influence of background and situational factors on the youth's performance on this test.

For readers not familiar with the data collecting system from which the data presented here were obtained, detailed information regarding the Health Examination Survey is presented in earlier reports,[3-5] with one containing information most relevant to the survey of adolescents.[5] Following is a brief description of the survey operation.

THE HEALTH EXAMINATION SURVEY

The Health Examination Survey is an ongoing program that collects data by direct examination of representative samples of the noninstitutionalized population of the United States. Since 1960 the survey has conducted a series of separate programs (called "cycles") concerned with specific segments of the total population and focused on certain aspects of the health of these subpopulations. Cycle III was an examination of youths 12-17 years of age, and it was a continuation of the immediately preceding cycle in which children aged 6-11 years were given an examination that focused on health factors related to growth and development. Information about the Cycle III survey design is presented in appendix I.

Each youth was examined during a single visit to a specially designed mobile unit. Along with the standardized examinations by a physician and dentist and a variety of tests and measurements performed by technicians, a 70-minute psychological test battery was given by a psychologist who had obtained at least a master's degree and had previous experience in ad-

[a] Formerly research psychologist with the Psychological Statistics Branch, DHES.

ministering tests. The battery included the following examinations that were administered in the order listed: Wide Range Achievement Test, arithmetic and reading sections; Wechsler Intelligence Scale for Children, vocabulary and block design subtests; a five-card, tape-recorded version of the Thematic Apperception Test; a modified version of the Goodenough-Harris Drawing Test; the Brief Test of Literacy; and a self-administered questionnaire concerning the youth's attitude and behavior relating to certain aspects of health. A critical evaluation of most of the psychological tests used in the survey, including a literature review of previous research and evaluations, was made by S. B. Sells of Texas Christian University. The National Center for Health Statistics has published the results of the evaluation in its methodological reports series.[6]

Before the youths were examined, information about the demographic and socioeconomic characteristics of household members and a medical history and behavioral data on the youths were obtained from parents. Performance and adjustment information was requested in a questionnaire sent to each youth's school. All information was obtained with a guarantee of strict confidentiality.

Of the 7,514 youths in the sample, 6,768 (90 percent) were examined. Sample design, adjustments for nonresponse, and weighting procedures were factors that produced results considered representative of the approximately 23 million noninstitutionalized youths aged 12-17 years in the United States at the time of the survey. Sampling errors associated with estimates in this report are presented in the detailed tables.

THE TEST

Information in this report is based on "person" and "self" figure drawings scored on the Goodenough-Harris scales.[2] The modification of the test used in this survey of adolescents is described fully in the initial report on the findings from Cycle III.[1] Two human figure drawings were requested of each youth during the psychological testing. Each of the drawings (person and self) was scored on the appropriate man or woman scale of the Goodenough-Harris instrument. A complete description of the history of figure drawing tests and development of the Goodenough-Harris scales is presented in Harris' text.[2] Brief summaries of that material are in two previous reports of this series.[1,7]

The presentation and descriptive analysis of test performance according to demographic and socioeconomic status of the youths will be limited in this report to the person figure drawing. The correlation ratio between the scores for the self and person drawings was 0.8. There are no material differences in conclusions concerning intellectual maturity that can be drawn from an examination of the results of the two types of drawings.

FINDINGS

Raw Scores and Standard Scores

The subject of the present study is the relationship of intellectual maturity, as indicated by performance on the drawing test, to background factors. Information on the relationships to age and sex of the Goodenough-Harris drawing test scores was presented in a previous publication[1] in which the main conclusion was that the increase in scores associated with age leveled off for both sexes between ages 15 and 16. This indicated that either further development of those capacities and abilities called "intellectual maturity" did not occur after age 15 or that the selected instrument was not sensitive enough to measure change in level after that age. In tables 1 and 2, where mean scores according to socioeconomic status are shown by age, it is demonstrated that this leveling off effect is preserved for all the subgroups examined and that scores for the man and woman drawings follow a similar pattern.

The raw scores for each age-sex group and for each scale (man and woman figures) separately were converted to normalized standard scores with a mean of 50 and standard deviation of 10 (T scores) in order to control for age and sex differences in performance. Thus, each sample youth has a "person T score" from which age effect and sex differences have been removed. These T score distributions are used in the remainder of this report for the purpose of examining the relationship of performance to socioeconomic status. To facilitate conversion of

raw scores to T scores, tables I-IV are presented in appendix I.

Background Factors

Background factors considered in this report were education of first-listed parent (usually the father), income of family over the past year, geographic region, type of area (urban-rural), rate of population change, size and kind of place of residence, and race. Each of these variables is related to one another in some way, and some are definitely related to performance on the ability or achievement tests administered in the survey. Although a valid claim can be made that the drawing test measures something other than achievement in early childhood, this assertion may be confounded by the fact that some youths develop in environments that are more conducive than others to advancing their ability to draw. Thus, it would not be surprising that, as in other types of achievement tests, there is a socioeconomic status link.

Family income and first parent's education were more closely correlated with test scores than the other factors were (table A). The negative biserial coefficient for race is the result of coding (white = 1, black = 2). The partial correlation coefficients throw additional light on the interrelationship of social factors and performance on the test. The biserial measure with race falls from −.15 to −.09 when the effect of income is held constant. For family income the ratio falls from +.19 to +.11 when the effect of education is held constant.

The multiple correlation ratio for the modified drawing test score and the statistically "best" combination of race, parental education, and family income was only .22, with a standard error of .03, a negligible gain over the zero order values for either education or income; therefore, it is not adequate for use in prediction.

Table A. Correlation coefficients for person T scores with socioeconomic variables and their standard errors

Socioeconomic Variables	Statistical measure	
	r	SE
Race	−.15	0.03
Region	.08	0.03
Size of place	−.03	0.03
Income	.19	0.02
Grade	.14	0.02
Parent's education	.17	0.02
Type of area	.07	0.02
Rate of population change	.09	0.03

Family income and education of parent.—Drawing test scores, shown to be related to income of family and parents' educational level, are presented according to the other background factors considered for the various income and education of parent categories in tables 3-12. An inspection of the mean scores for the entire population reveals a consistently increasing trend with both income and education (table 3). Table 4 indicates that this is also true when either of these variables is held constant. There is no evidence in these data that education of parent had a stronger effect on performance than income level, or vice versa.

Geographic region.—The data at first glance indicate some regional differences, with the mean score for the South being somewhat lower than those for the Midwest and Northeast (table 3). However, examination of scores according to education of parent and family income provides some insight into the basis for these differences. Distributions by income and education for the four regions are distinctly different (see table V, appendix I). Thus, the lower means in the South—and to some extent in the West—reflect the existence of lower incomes and parents with fewer years of education compared with the other areas. There is every indication that in each region scores are higher for youths whose families had higher incomes and more education (table 4 and figure 1).

Type of area.—A similar analysis was made for the urban-rural contrast (tables 5 and 6) that yielded the same general conclusions as those offered with respect to region (see table VI, appendix I). Overall, urban adolescents achieved a slightly higher average score than those from the rural areas. Income and education of parent (figure 2) remained the important factors in determining test scores.

Rate of population change.—Tables 7 and 8 present drawing test scores for the youths according to rate of population change at place of residence. For each category of family income and parental education, youths residing in areas

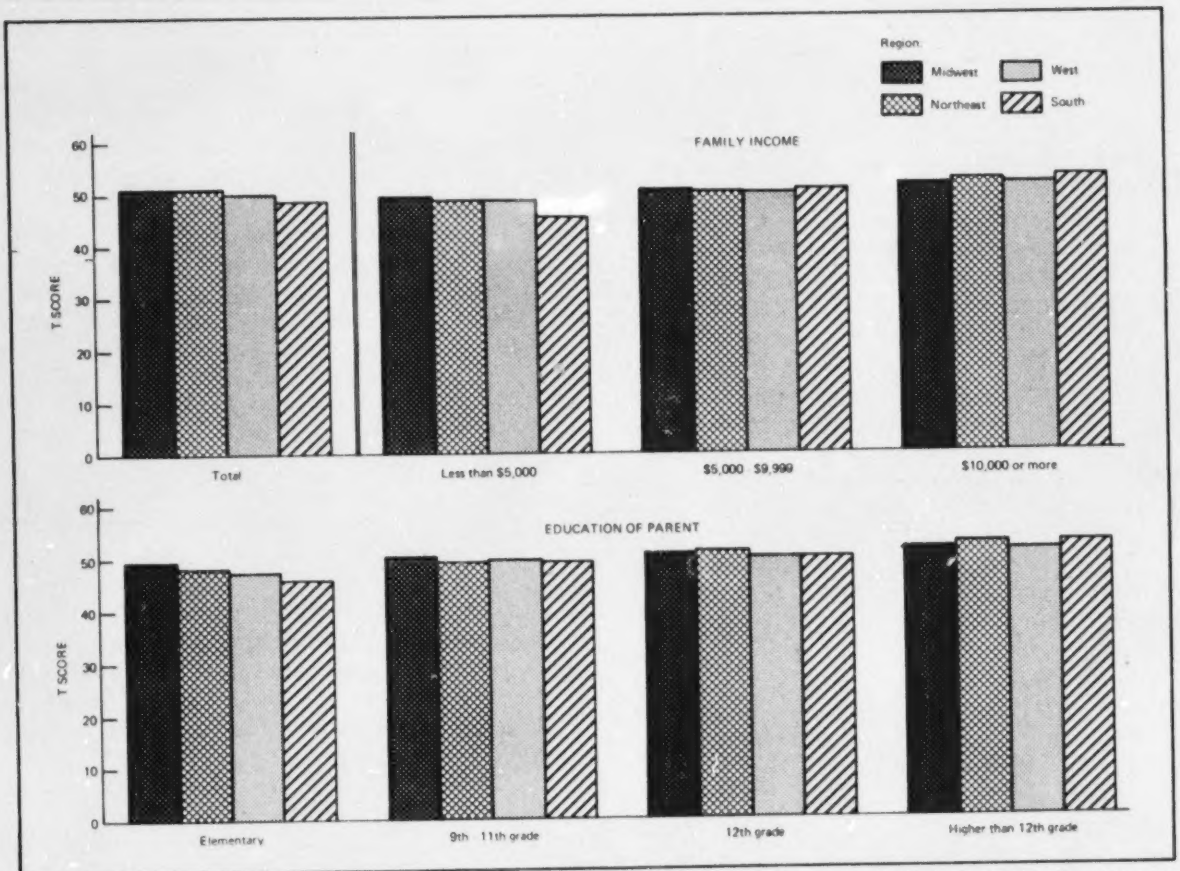

Figure 1. Average T scores of youths 12-17 years of age on the Goodenough-Harris Drawing Test, by family income, education of parent, and geographic region: United States, 1966-70

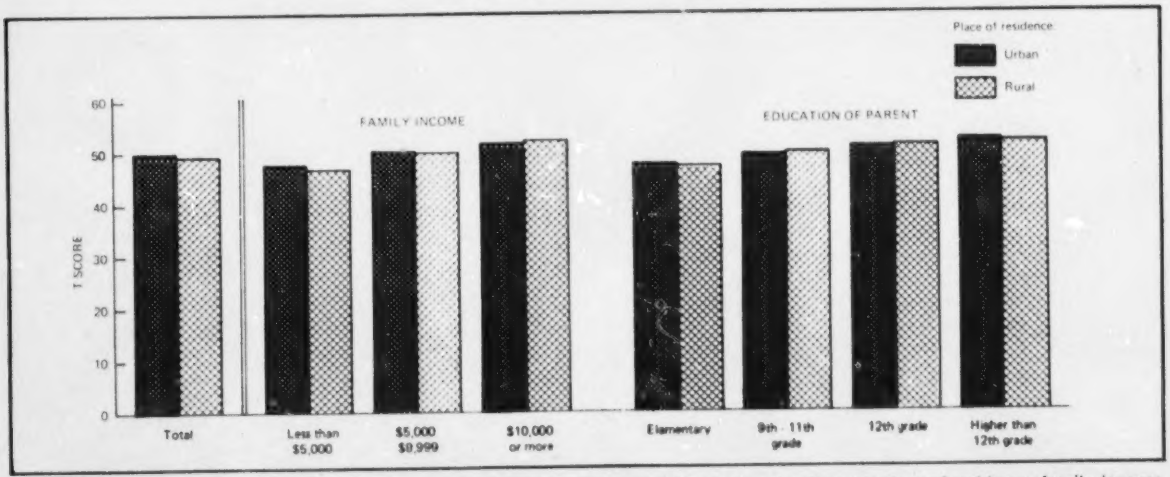

Figure 2. Average T scores of youths 12-17 years of age on the Goodenough-Harris Drawing Test, by place of residence, family income, and education of parent: United States, 1966-70

with above-average increases in population between 1950 and 1960 made higher scores than those residing in areas with declining populations (figure 3). The differences are sufficient to suggest that type of community as distingushed by rate of population change may be further associated with test performance, given income and education of parent.

Location of household.—When considering data shown in tables 9 and 10, the designations "In central city of SMSA" and "Not in central city of SMSA" should not be confused with the notions of "within inner city" and "not in inner city"; although, if it were possible, the latter distinction would be more suitable for this analysis. As characterized, the test scores do not show any marked differences, but this does not mean that none would be found with a more meaningful grouping. However, as in the other classifications, the data exhibit trends by income and education.

Progression through school.—Youths aged 12-17 years could not be grouped to represent more than one or two of six school grade levels in which most of them were assigned. In order to get drawing test performance data with respect to the youth's progress through school, average standard scores were derived for the youths in groups according to grade with respect to age. The youths were classified as above modal grade,

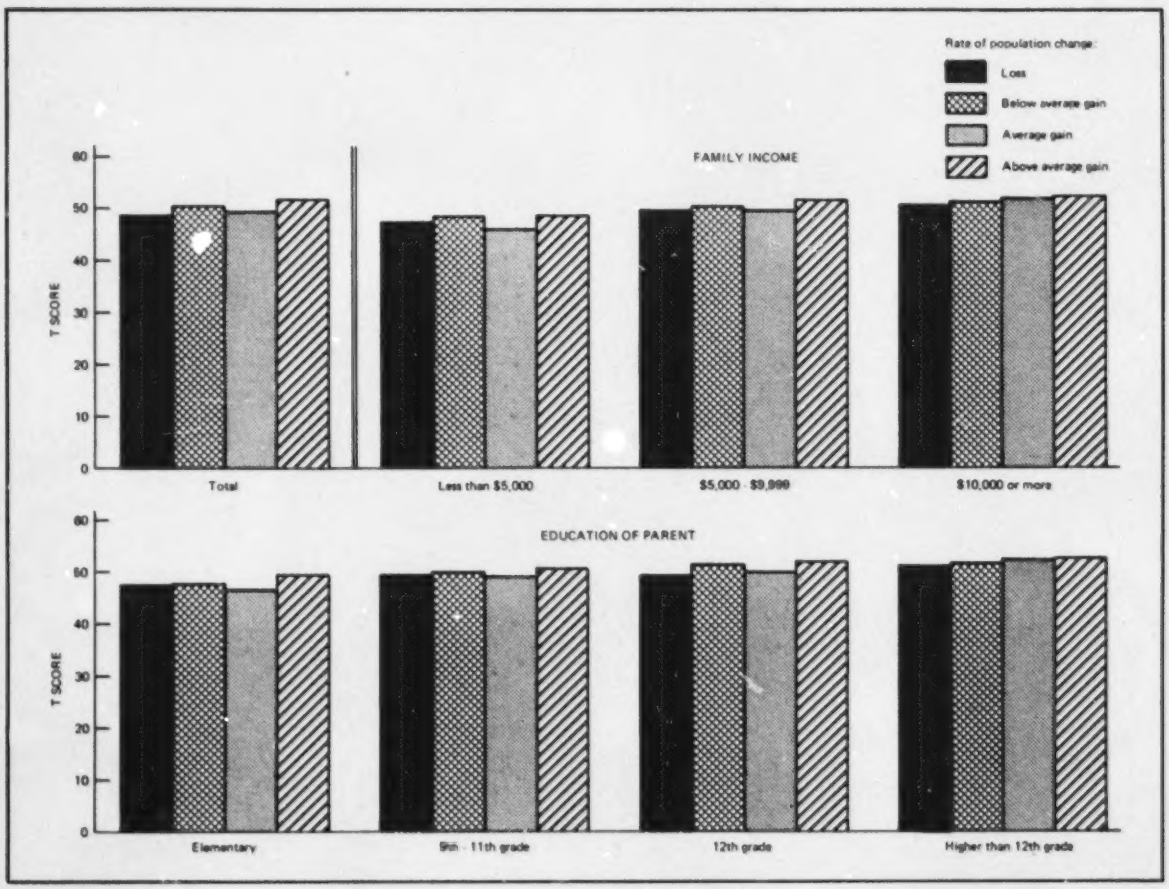

Figure 3. Average T scores of youths 12-17 years of age on the Goodenough-Harris Drawing Test, by family income, education of parent, and rate of population change: United States, 1966-70

in modal grade, or below modal grade. The modal level for 12-year-olds was the seventh grade, that for 13-year-olds was the eighth, and so forth. Test scores for the youths in the three grade groups are shown in tables 11 and 12 according to family income and education of parent and in table 13 according to certain other demographic and socioeconomic characteristics of the youths. Youths assigned to levels above the modal grade made higher scores than those made by their counterparts in grades below the modal level. This was the case in all but one category of family income or parental education. Similar differences in performance with respect to relative grade level were observed for each of the remaining demographic or socioeconomic groups considered.

Relative school grade reflects many combinations of strong influences related to demographic characteristics, socioeconomic factors, and certain political or social decisions (figures 4 and 5). Background factors are also associated with intellectual maturity, the level of which the drawing test is supposed to measure.

Distributions of the youths by type of early school attended are presented according to selected demographic characteristics or socioeconomic factors in table 14. One-third of the youths attended neither nursery school nor kindergarten, and about 9 percent attended both.

Nursery school and kindergarten attendance proved to be definitely related to education of parent and family income. Larger proportions of

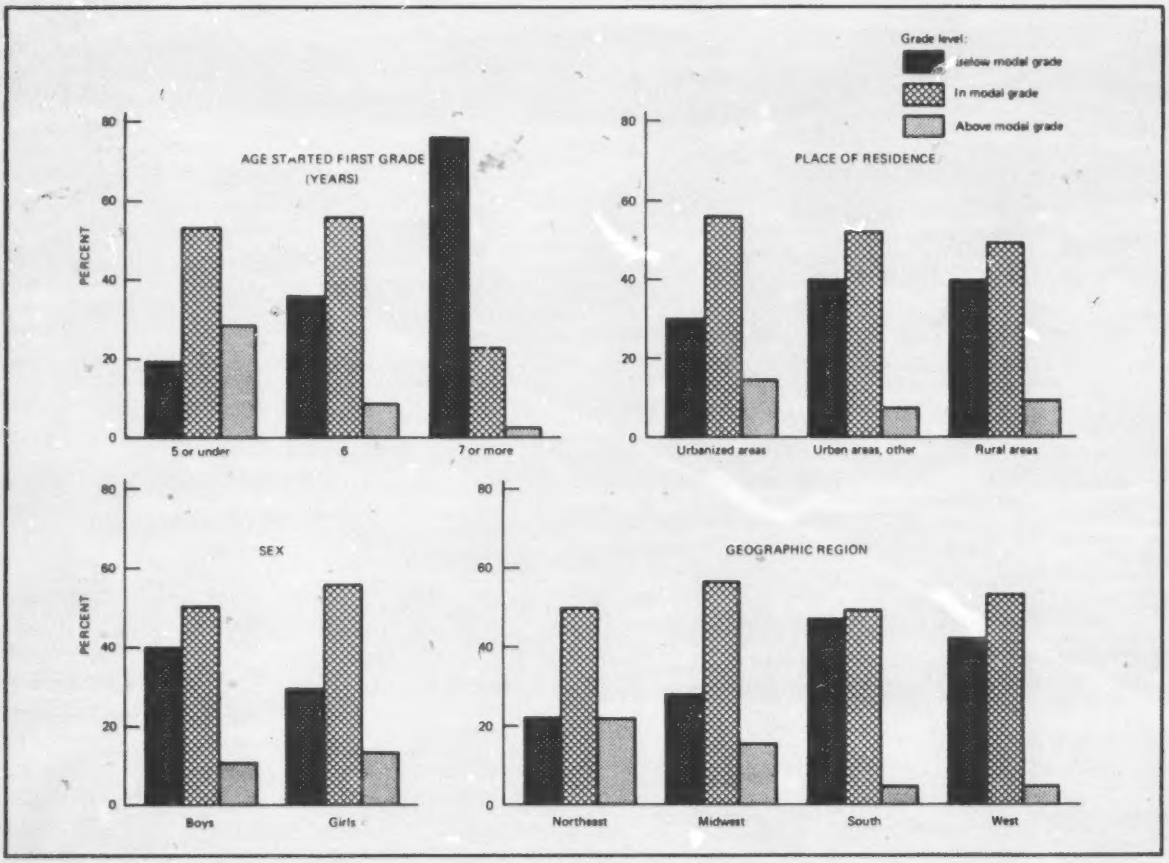

Figure 4. Percent of youths 12-17 years of age within each modal grade level, by selected demographic characteristics: United States, 1966-70

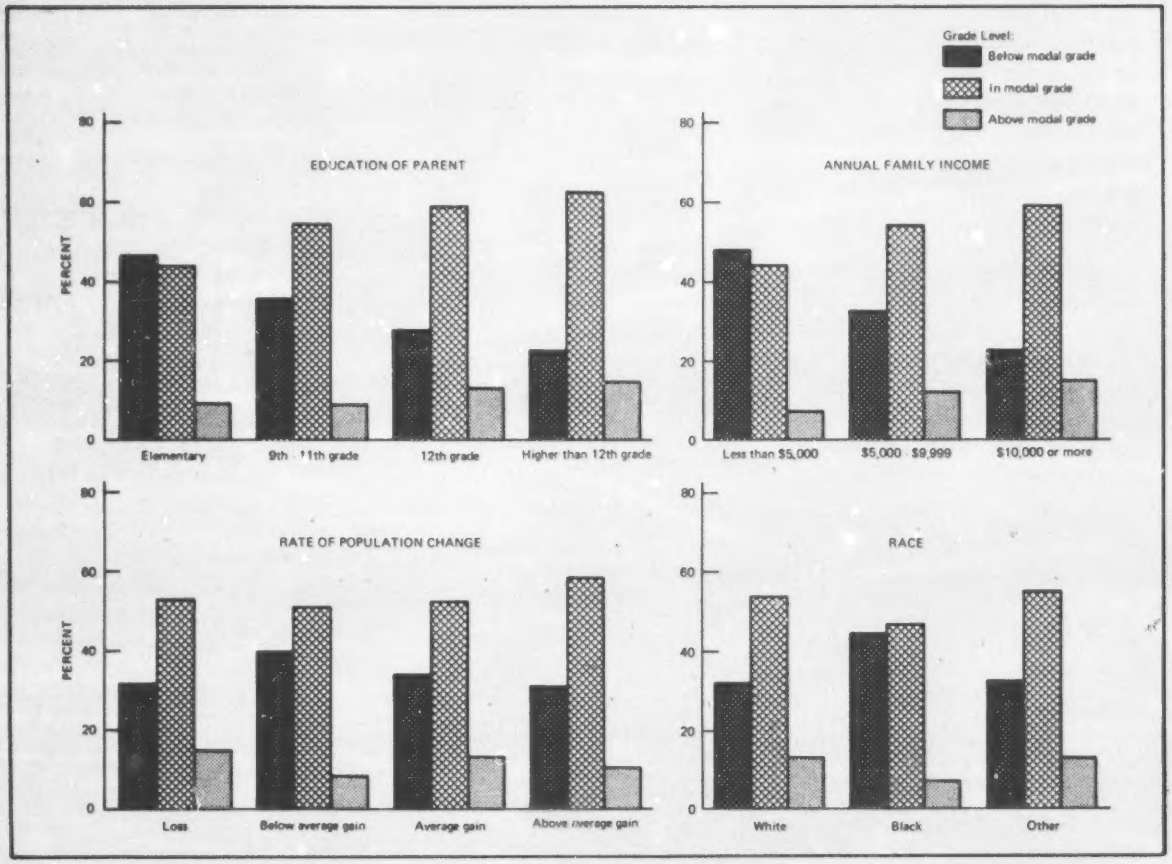

Figure 5. Percent of youths 12-17 years of age within each modal grade level, by selected socioeconomic characteristics: United States, 1966-70

youths whose parents had more years of formal education and of those from families with higher incomes attended nursery school and kindergarten. More urban than rural youths and more youths living in areas with expanding populations attended early schools. Two-thirds of the youths from the South had not attended nursery school or kindergarten, compared with one-fourth of the youths in the rest of the country.

On the scale of test scores, youths who attended both nursery school and kindergarten had scores that were the highest and those who attended neither nursery school nor kindergarten had scores that were the lowest. Regardless of socioeconomic status, youths who attended both nursery school and kindergarten tended to have higher average scores than those who attended neither (table 15).

The age at which the youths started first grade appeared to be a better predictor of actual grade in relation to modal grade than other available variables. It seemed to be the best information with which to evaluate the influence of certain background factors on school progression and test performance. Youths whose parents had less formal education and lower family income started school later than youths whose parents were more educated and had higher incomes (table 14). Enrollment in the first grade after the seventh birthday occurred more frequently in the South than in the other geographic regions, even

after consideration of differences in the distribution of the youths by region and according to family income and education of parent. Average drawing test scores were consistently higher for youths who started first grade earlier, regardless of education of parent, family income, place of residence (an urban-rural distinction), rate of population change for the community, race, or geographic region (table 16).

Overall, the differences in average scores on the drawing test with respect to these school-related factors were in the same direction as the averages for other tests of intellectual development or school achievement that were administered to youths during the survey. However, the effects of these factors on the drawing test scores were of significantly lesser magnitudes than they were on those recorded for the vocabulary, nonverbal, reading, or arithmetic tests, for which differences as large as one standard deviation were observed (table B).

Race.—Racial evaluations must be made in conjunction with the distribution of the population according to income and education and the meaning of these variables for the two groups. Differences in performance according to income and educational levels are consistent for the two racial groups (figure 6). The greater fluctuation in mean scores for black adolescents reflects smaller sample frequencies in some groups with their associated larger errors of estimate (tables 17 and 18). Other racial differences should be interpreted in light of the fact that classification according to income and education may not adequately define sufficiently comparable groups with respect to living circumstances or atmosphere when intellectual growth or achievement is considered. It is understood that a given number of years of formal education does not necessarily indicate the same level of intellectual achievement for all segments of the U.S. population. But the differences are greater for the grouping by race than for other groupings, such as those by income or education. Further, level of income or years of education is a reliable measure of socioeconomic status only to the extent that there exists the freedom to utilize such assets to produce an appropriate environment. With respect to race, social restrictions and traditions

Table B. Comparison of relationships of early school experience and relative grade level in school to scores of youths 12-17 years of age on the Goodenough-Harris Drawing Test, two Wechsler Intelligence Scale for Children subtests, and two Wide Range Achievement Test subtests: United States, 1966-70

Type of test or subtest	Average T score	Differences in average score between groups as indicated[1]		
		Attendance at nursery school and kindergarten[2]	Age started school[3]	Modal grade for age[4]
Goodenough-Harris Drawing Test	50.0	2.5	3.2	4.7
Wechsler Intelligence Scale for Children:				
Vocabulary subtest	50.0	8.7	9.5	8.8
Block Design subtest	50.0	5.5	6.0	6.0
Wide Range Achievement Test:				
Reading subtest	50.0	7.7	7.8	10.4
Arithmetic subtest	50.0	5.8	6.6	8.8

[1] The values shown represent statistically significant differences (one-tailed t test, $p < .01$).

[2] The average standard score for youths who attended neither nursery school nor kindergarten was subtracted from the corresponding average score of those who attended both.

[3] The average standard score for youths who started first grade at age 7 or after was subtracted from the corresponding average score of those who started first grade at age 5 or before.

[4] The average standard score for youths who were in grades below the modal grade for their respective ages was subtracted from the average score for those who were in grades above the modal level.

have imposed more limits in connection with this transformation for black persons than for white ones. Somewhat related are the varied effects that the difference in historical experience has had on those factors associated with progression through school. This has been shown to be related in a limited degree to performance on the drawing test.

Although the man and woman drawings were in general combined to yield valid "person scores," a noteworthy observation concerning the drawings is a difference in the preference for "same-sex" drawings between the white and black adolescents. Table C shows the percentage of the youths who drew persons of their own sex.

White boys were significantly more inclined to draw the same-sex figure than were white girls

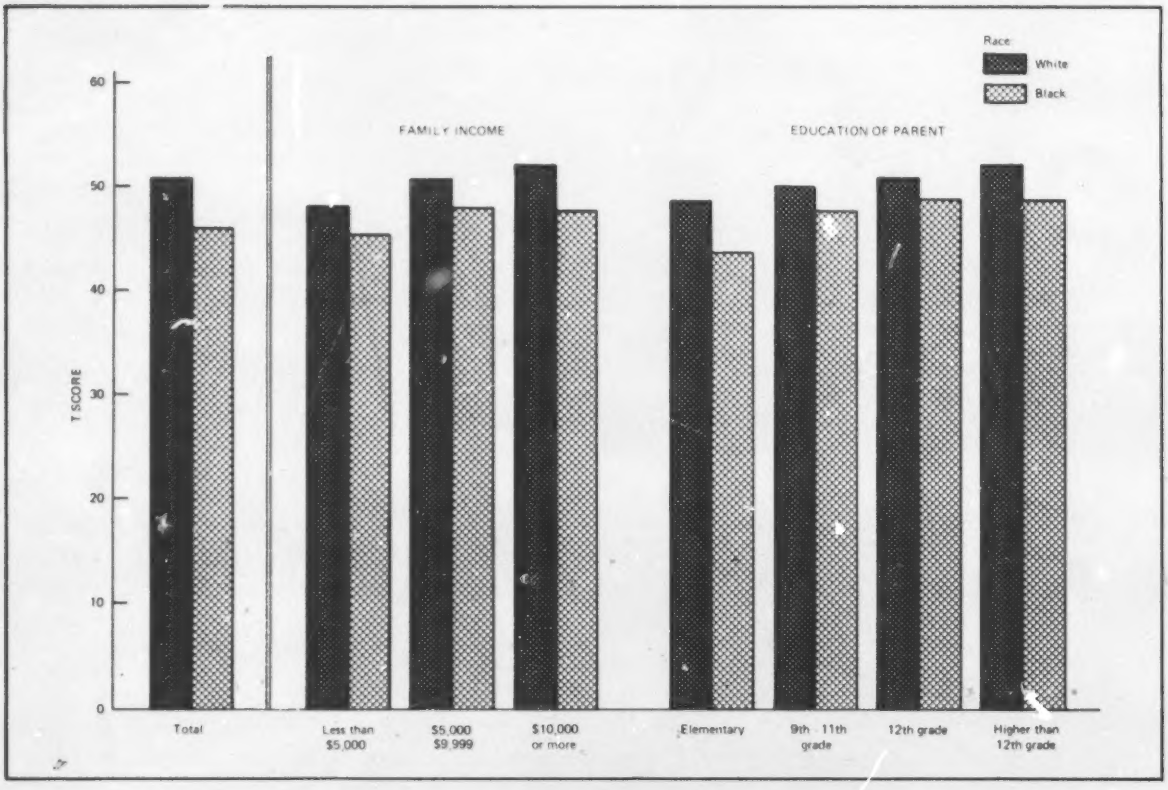

Figure 6. Average T scores of youths 12-17 years of age on the Goodenough-Harris Drawing Test, by race, family income, and education of parent: United States, 1966-70

(89.5 percent compared with 74.8 percent; $t = 14.55$, $p < .0001$). The same is true of blacks, the difference being substantially less and only approaching statistical significance (84.7 percent compared with 80.5 percent; $t = 1.75$, $p < .05$). White boys significantly more often drew the same-sex (male) figure than blacks boys ($t = 2.76$, $p < .01$); while white girls were less likely to draw the same-sex (female) figure than black girls ($t = 2.95$, $p < .01$). The hypothesis frequently advanced in clinical literature is that the decision to draw a "person" of a particular sex represents an unconscious sex-role identification. If this is sound, this observation has some interesting implications when sex-role identification for the two races is considered. In light of another hypothesis, that the sex of the figure drawn reflects the subtle effects of perceived role prestige in society, there are other interesting implications. Conclusions concerning this controversial issue are left to the reader; the data are available for interpretation based on the reader's theoretical inclinations.

Table C. Percent of youths 12-17 years of age who drew a figure of the same sex when asked to draw a "person," by race and sex, with associated standard errors: United States: 1966-70

Sex	Total	White	Black
	Percent of youths		
Boys	88.9	89.5	84.7
Girls	75.7	74.8	80.5
	Standard error of percent		
Boys	0.53	0.56	1.65
Girls	0.76	0.84	1.74

SUMMARY AND CONCLUSIONS

This report presents results of a modified version of the Goodenough-Harris Drawing Test in relation to selected demographic and socioeconomic factors as they affect youths aged 12-17 years in the noninstitutionalized population of the United States. The findings are based on data gathered in the Health Examination Survey of 1966-70. A probability sample of 7,514 youths was selected to represent the 23 million youths in this age range in the United States at the time of the survey. Of this sample, 6,768 (90 percent) were examined.

In the field study, each youth was asked to draw a "person" and then to draw a self-portrait, both of which were to include the whole figure, not the face alone. Data of a previous report[1] and of the present monograph are based on the "person" figure, evaluated by the appropriate sex scoring standards of the Goodenough-Harris procedure.[2] The earlier report on these youths contained general findings by age and sex. Collected from a rigorously controlled national sample, probably one of the most carefully designed samples ever to be used in a national psychometric study, these data indicate that the ceiling effect of the Goodenough-Harris Test, which was noted in the analysis by age and sex, persists across the socioeconomic and demographic groups considered here.

There is a consistent positive relationship between the level of parental education (usually the father's) and the youth's test score. An equally consistent positive association exists between the youth's drawing score and the income of his family. When either one of these factors is held constant, the effect of the other persists. These relationships are shown to be robust over other background factors considered here. It appears that if one could control all those factors in the socioeconomic environment that income and education attempt to describe, differences related to factors other than income and education would be negligible. The data do not yield any significant information on differences among geographic regions, between urban and rural areas, or among racial groups which are not to a large degree ascribable to socioeconomic status. Location of household with respect to city or suburbs was not significant, but rate of population change in the area of residence was associated with some small difference in performance.

Drawing test scores related to the progress of the youths through school—as described by their attendance at nursery school or kindergarten, the age they started first grade, and their grade attainment levels relative to the modal grade for their respective ages—were examined for variation among the various demographic or socioeconomic categories. Differences in drawing test performance associated with school-related actions were considerably smaller than those observed for the reading and arithmetic achievement tests administered to these youths.

In general, the relationship between drawing test performance and socioeconomic status described in this report is similar but weaker than that demonstrated for children aged 6-11 years in an earlier study using this test. The test functioned as a general ability measure in the earlier years of the adolescent period studied, but after about age 15 it discriminated only in the lower reaches of the ability distribution.

REFERENCES

[1] National Center for Health Statistics: The Goodenough-Harris Drawing Test as a measure of intellectual maturity of youths 12-17 years, United States. *Vital and Health Statistics*. PHS Pub. No. 1000-Series 11-No. 138. Public Health Service. Washington. U.S. Government Printing Office, May 1974.

[2] Harris, D.B.: *Children's Drawings as Measures of Intellectual Maturity*. New York. Harcourt, Brace, & World, Inc., 1963.

[3] National Center for Health Statistics: Plan and initial program of the Health Examination Survey. *Vital and Health Statistics*. PHS Pub. No. 1000-Series 1-No. 4. Public Health Service. Washington. U.S. Government Printing Office, July 1965.

[4] National Center for Health Statistics: Plan, operation, and response results of a program of children's examinations. *Vital and Health Statistics*. PHS Pub. No. 1000-Series 1-No. 5. Public Health Service. Washington. U.S. Government Printing Office, Oct. 1967.

[5] National Center for Health Statistics: Plan and operation of a health examination survey of U.S. youths 12-17 years of age. *Vital and Health Statistics*. PHS Pub. No. 1000-Series 1-No. 8. Public Health Service. Washington. U.S. Government Printing Office, Sept. 1969.

[6] National Center for Health Statistics: Evaluation of psychological measures used in the Health Examination Survey of children ages 6-11. *Vital and Health Statistics*. PHS Pub. No. 1000-Series 2-No. 15. Public Health Service. Washington. U.S. Government Printing Office, Mar. 1966.

[7] National Center for Health Statistics: Intellectual maturity of children as measured by the Goodenough-Harris Drawing Test, United States. *Vital and Health Statistics*. PHS Pub. No. 1000-Series 11-No. 105. Public Health Service. Washington. U.S. Government Printing Office, Dec. 1970.

[8] National Center for Health Statistics: Sample design and estimation procedures for a national health examination survey of children. *Vital and Health Statistics*. PHS Pub. No. 1000-Series 2-No. 43. Public Health Service. Washington. U.S. Government Printing Office, Aug. 1971.

[9] National Center for Health Statistics: Quality control in a national health examination survey. *Vital and Health Statistics*. Series 2-No. 44. DHEW Pub. No. (HSM) 72-1023. Health Services and Mental Health Administration. Washington. U.S. Government Printing Office, Feb. 1972.

[10] National Center for Health Statistics: Replication: An approach to the analysis of data from complex surveys. *Vital and Health Statistics*. PHS Pub. No. 1000-Series 2-No. 14. Public Health Service. Washington. U.S. Goverment Printing Office, Apr. 1966.

[11] National Center for Health Statistics: Pseudoreplication: Further evaluation and application of the balanced half-sample technique. *Vital and Health Statistics*. PHS Pub. No. 1000-Series 2-No. 31. Public Health Service. Washington. U.S. Government Printing Office, Jan. 1969.

———— ○○○ ————

LIST OF DETAILED TABLES

1. Mean raw scores of youths 12-17 years of age on the Goodenough-Harris Drawing Test on the male figure, by age and selected demographic or socioeconomic characteristics: United States, 1966-70. 13

2. Mean raw scores of youths 12-17 years of age on the Goodenough-Harris Drawing Test on the female figure, by age and selected demographic or socioeconomic characteristics: United States, 1966-70. 14

3. Average T scores of youths 12-17 years of age on the Goodenough-Harris Drawing Test, by geographic region, family income, and education of parent, with associated standard errors: United States, 1966-70. 15

4. Average T scores of youths 12-17 years of age on the Goodenough-Harris Drawing Test, by geographic region, family income, and education of parent, with associated standard errors: United States, 1966-70. 16

5. Average T scores of youths 12-17 years of age on the Goodenough-Harris Drawing Test, by type of area, family income, and education of parent, with associated standard errors: United States, 1966-70. 17

6. Average T scores of youths 12-17 years of age on the Goodenough-Harris Drawing Test, by type of area, family income, and education of parent, with associated standard errors: United States, 1966-70. 18

7. Average T scores of youths 12-17 years of age on the Goodenough-Harris Drawing Test, by rate of population change, family income, and education of parent, with associated standard errors: United States, 1966-70. 19

8. Average T scores of youths 12-17 years of age on the Goodenough-Harris Drawing Test, by rate of population change, family income, and education of parent, with associated standard errors: United States, 1966-70. 20

9. Average T scores of youths 12-17 years of age on the Goodenough-Harris Drawing Test, by location of household, family income, and education of parent, with associated standard errors: United States, 1966-70. 21

10. Average T scores of youths 12-17 years of age on the Goodenough-Harris Drawing Test, by location of household, family income, and education of parent, with associated standard errors: United States, 1966-70. 22

11. Average T scores of youths 12-17 years of age on the Goodenough-Harris Drawing Test, by grade level with respect to age, family income, and education of parent, with associated standard errors: United States, 1966-70. 23

12. Average T scores of youths 12-17 years of age on the Goodenough-Harris Drawing Test, by grade level with respect to age, family income, and education of parent, with associated standard errors: United States, 1966-70. 24

13. Average T scores of youths 12-17 years of age on the Goodenough-Harris Drawing Test, by grade level with respect to age and selected demographic or socioeconomic characteristics, with associated standard errors: United States, 1966-70. 25

14. Percent distribution of youths 12-17 years of age, by type of early school attended and age started first grade, according to selected demographic or socioeconomic characteristics: United States, 1966-70. 26

15. Average T scores of youths 12-17 years of age on the Goodenough-Harris Drawing Test, by type of early school attended and selected demographic or socioeconomic characteristics, with associated standard errors: United States, 1966-70. 27

16. Average T scores of youths 12-17 years of age on the Goodenough-Harris Drawing Test, by age the youth started first grade and selected demographic or socioeconomic characteristics, with associated standard errors: United States, 1966-70. 28

17. Average T scores of youths 12-17 years of age on the Goodenough-Harris Drawing Test, by race, family income, and education of parent, with associated standard errors: United States, 1966-70. 29

18. Average T scores of youths 12-17 years of age on the Goodenough-Harris Drawing Test, by race, family income, and education of parent, with associated standard errors: United States, 1966-70. 30

Table 1. Mean raw scores of youths 12-17 years of age on the Goodenough-Harris Drawing Test on the male figure, by age and selected demographic or socioeconomic characteristics: United States, 1966-70[1]

Demographic or socioeconomic characteristic	Total	Age (in years)					
		12	13	14	15	16	17
	Raw score						
All youths, 12-17 years	37.2	34.4	35.5	37.5	37.9	38.8	38.8
Family income							
Less than $5,000	35.1	32.5	33.4	35.2	35.3	37.5	36.4
$5,000 - 9,999	37.3	34.7	35.6	37.5	38.2	38.7	39.2
$10,000 or more	38.7	35.7	37.0	39.6	39.5	40.0	40.4
Education of parent							
Elementary school	35.2	33.1	33.4	34.7	36.0	37.3	36.6
9th - 11th grade	37.3	34.4	35.5	36.8	37.4	40.4	39.3
12th grade	37.7	34.6	36.6	38.4	38.9	38.1	39.5
Higher than 12th grade	38.7	35.6	36.4	39.9	39.6	40.3	41.0
Race							
White	37.6	34.6	36.1	38.1	38.2	39.2	39.5
Black	33.9	33.2	31.5	33.5	35.3	35.8	34.2
Geographic region							
Northeast	37.4	34.8	35.6	37.2	38.5	39.3	39.1
Midwest	37.8	35.0	36.4	38.5	38.0	39.4	39.7
South	36.2	33.2	33.7	37.9	37.5	37.8	36.8
West	37.1	34.6	35.9	36.6	37.6	38.6	39.5
Type of area							
Urban	37.4	34.6	35.8	37.6	38.0	39.0	39.0
Rural	36.8	34.1	34.8	37.4	37.6	38.4	38.5
Rate of population change							
Loss	35.9	32.8	34.2	36.5	36.4	37.8	37.5
Below average gain	37.7	35.0	35.8	37.9	38.5	38.8	39.6
Average gain	36.6	34.5	35.2	35.7	37.2	39.4	38.6
Above average gain	38.1	35.2	36.6	39.4	39.0	39.1	39.5
Location of household							
In central city of SMSA	37.0	34.2	36.0	36.4	37.9	38.8	38.7
Not in central city of SMSA	37.6	35.0	35.6	38.5	38.5	39.4	39.0
Not in SMSA	36.8	34.0	34.9	37.6	37.3	38.2	38.8
	Standard error of score						
All youths, 12-17 years	0.24	0.29	0.25	0.40	0.48	0.52	0.34

[1] Data on youths for which classification according to the indicated characteristic was unknown are included in the totals, but are excluded from the subgroups shown. The number of youths whose race was reported as other than white or black was too small to yield reliable estimates of the measure presented; therefore, this category was omitted.

Table 2. Mean raw scores of youths 12-17 years of age on the Goodenough-Harris Drawing Test on the female figure, by age and selected demographic or socioeconomic characteristics: United States, 1966-70[1]

Demographic or socioeconomic characteristic	Total	Age (in years)					
		12	13	14	15	16	17
	Raw score						
All youths, 12-17 years	38.2	36.5	37.4	38.9	39.1	38.7	39.0
Family income							
Less than $5,000	35.9	34.7	35.8	36.0	36.4	36.6	36.7
$5,000 - 9,999	38.7	37.0	37.3	39.7	40.4	38.8	40.3
$10,000 or more	39.9	38.0	39.1	41.4	40.9	40.7	39.4
Education of parent							
Elementary school	36.4	35.2	35.5	36.0	37.0	37.4	37.8
9th - 11th grade	37.7	35.8	36.5	39.5	38.0	37.8	38.7
12th grade	39.0	37.2	38.8	40.4	40.2	38.5	39.3
Higher than 12th grade	40.2	37.8	38.8	41.0	42.8	41.5	40.3
Race							
White	38.7	36.9	37.8	39.3	39.6	39.3	39.6
Black	35.5	33.9	35.0	36.8	36.4	35.6	36.1
Geographic region							
Northeast	39.1	38.1	37.3	41.0	39.8	39.6	39.8
Midwest	38.6	36.6	38.2	39.5	39.2	39.9	38.8
South	36.8	35.2	35.2	37.3	38.6	36.1	38.7
West	38.2	36.0	38.4	38.3	39.1	39.0	38.9
Type of area							
Urban	38.3	36.5	37.3	39.5	39.4	38.8	39.1
Rural	37.9	36.5	37.5	38.0	38.6	38.6	38.9
Rate of population change							
Loss	37.4	36.2	36.2	37.7	38.1	37.8	39.5
Below average gain	37.9	36.2	38.0	38.2	38.0	39.2	38.4
Average gain	37.6	36.0	36.4	38.4	40.0	38.3	37.6
Above average gain	39.8	37.9	39.1	41.4	40.3	39.5	40.5
Location of household							
In central city of SMSA	37.9	35.9	35.8	38.8	40.0	39.0	39.1
Not in central city of SMSA	38.2	36.5	38.2	39.6	38.4	38.5	37.9
Not in SMSA	38.4	36.9	37.9	38.4	39.2	38.9	40.0
	Standard error of score						
All youths, 12-17 years	0.29	0.39	0.50	0.52	0.37	0.33	0.44

[1] Data on youths for which classification according to the indicated characteristic was unknown are included in the totals, but are excluded from the subgroups shown. The number of youths whose race was reported as other than white or black was too small to yield reliable estimates of the measure presented; therefore, this category was omitted.

Table 3. Average T scores of youths 12-17 years of age on the Goodenough-Harris Drawing Test, by geographic region, family income, and education of parent, with associated standard errors: United States, 1966-70

Family income and education of parent	Geographic region									
	Total	North-east	Mid-west	South	West	Total	North-east	Mid-west	South	West
	Average T score					Standard error of T score				
All youths, 12-17 years	50.0	50.7	50.7	48.5	49.9	0.30	0.41	0.71	0.75	0.60
Family income										
Less than $3,000	46.5	48.3	50.3	44.1	48.9	0.78	1.75	1.48	0.90	0.91
$3,000 - 4,999	48.2	49.0	49.0	47.1	48.3	0.37	0.67	1.16	0.54	1.14
$5,000 - 6,999	49.6	49.5	49.8	48.6	50.1	0.52	0.88	1.19	0.86	1.12
$7,000 - 9,999	51.0	51.0	51.1	52.4	49.8	0.44	0.87	0.99	0.67	0.67
$10,000 - 14,999	51.6	52.5	51.0	52.6	51.0	0.51	0.76	1.20	0.79	0.78
$15,000 or more	52.7	52.8	52.3	53.7	52.3	0.61	1.42	1.17	1.03	1.39
Education of parent										
None	43.0	*	45.8	42.1	43.4	2.03	...	7.02	1.42	10.58
Less than 5 years	45.4	49.4	48.0	43.3	47.9	0.91	1.51	2.40	0.55	2.63
5 - 7 years	47.7	47.9	49.6	46.6	48.8	0.62	1.38	1.63	0.87	1.14
8 years	49.0	48.6	49.6	48.7	48.7	0.51	0.72	1.34	0.78	1.18
9 - 11 years	49.8	49.6	50.3	49.3	49.9	0.31	0.49	0.60	0.93	0.29
12 years	50.9	51.4	51.0	50.5	50.4	0.39	0.62	0.84	0.76	0.98
13 - 15 years	52.0	52.7	51.7	52.2	51.7	0.60	2.11	1.09	0.80	0.94
16 years	52.0	52.7	51.9	52.7	51.0	0.45	0.70	0.48	1.12	1.42
17 years or more	52.9	53.7	52.1	54.5	51.9	0.40	1.14	0.45	1.30	1.15

Table 4. Average T scores of youths 12-17 years of age on the Goodenough-Harris Drawing Test, by geographic region, family income, and education of parent, with associated standard errors: United States, 1966-70

Family income and education of parent	Geographic region									
	Total	North-east	Mid-west	South	West	Total	North-east	Mid-west	South	West
	Average T score					Standard error of T score				
All youths, 12-17 years	50.0	50.7	50.7	48.5	49.9	0.30	0.41	0.71	0.75	0.60
Income of less than $5,000										
Education of parent:										
Elementary school	46.4	48.2	48.3	45.0	47.4	0.51	1.07	1.31	0.72	0.92
9th - 11th grade	48.4	48.9	50.9	45.2	49.4	0.63	1.35	0.80	1.20	1.05
12th grade	48.6	49.4	48.5	46.2	50.0	0.89	2.43	2.40	1.06	1.99
Higher than 12th grade	50.5	46.3	50.5	52.9	49.9	1.13	5.89	1.02	2.13	1.70
Income of $5,000 - 9,999										
Education of parent:										
Elementary school	49.1	49.2	49.6	48.5	48.7	0.86	1.29	1.57	0.62	2.03
9th - 11th grade	50.1	49.8	49.3	52.1	49.8	0.49	0.62	0.73	1.06	0.79
12th grade	50.8	51.0	51.1	51.7	49.9	0.36	0.65	0.67	0.68	0.89
Higher than 12th grade	52.0	51.4	53.8	50.8	51.7	0.57	0.62	1.45	1.01	1.34
Income of $10,000 or more										
Education of parent:										
Elementary school	50.3	47.7	50.7	50.9	52.9	0.58	1.33	0.90	2.51	4.56
9th - 11th grade	51.4	50.6	52.4	51.6	50.7	0.81	2.65	1.25	1.41	1.18
12th grade	51.9	52.9	51.5	51.9	51.6	0.42	0.66	0.81	0.87	0.93
Higher than 12th grade	52.4	53.9	51.3	54.1	51.5	0.42	1.33	0.28	0.81	0.86

Table 5. Average T scores of youths 12-17 years of age on the Goodenough-Harris Drawing Test, by type of area, family income, and education of parent, with associated standard errors: United States, 1966-70

Family income and education of parent	Type of area					
	Total	Urban	Rural	Total	Urban	Rural
	Average T score			Standard error of T score		
All youths, 12-17 years	50.0	50.2	49.6	0.30	0.26	0.50
Family income						
Less than $3,000	46.5	47.1	45.8	0.78	1.06	0.82
$3,000 - 4,999	48.2	48.3	47.9	0.37	0.41	0.70
$5,000 - 6,999	49.6	49.6	49.4	0.52	0.56	0.98
$7,000 - 9,999	51.0	51.0	51.0	0.44	0.54	0.49
$10,000 - 14,999	51.6	51.4	52.1	0.51	0.58	0.65
$15,000 or more	52.7	52.6	52.7	0.61	0.52	1.37
Education of parent						
None	43.0	45.0	41.4	2.03	2.95	1.93
Less than 5 years	45.4	46.9	44.0	0.91	1.32	0.67
5 - 7 years	47.7	48.0	47.2	0.62	0.80	0.72
8 years	49.0	48.1	49.9	0.51	0.48	0.76
9 - 11 years	49.8	49.7	50.0	0.31	0.31	0.58
12 years	50.9	50.8	51.0	0.39	0.34	0.68
13 - 15 years	52.0	52.2	51.3	0.60	0.81	1.14
16 years	52.0	52.2	51.5	0.45	0.51	1.06
17 years or more	52.9	52.8	53.1	0.40	0.58	1.56

Table 6. Average T scores of youths 12-17 years of age on the Goodenough-Harris Drawing Test, by type of area, family income, and education of parent, with associated standard errors: United States, 1966-70

Family income and education of parent	Type of area					
	Total	Urban	Rural	Total	Urban	Rural
	Average T score			Standard error of T score		
All youths, 12-17 years of age	50.0	50.2	49.6	0.30	0.26	0.50
Income of less than $5,000						
Education of parent:						
Elementary school	46.4	47.1	45.8	0.51	0.78	0.62
9th - 11th grade	48.4	48.5	48.2	0.63	0.78	0.97
12th grade	48.6	48.2	49.3	0.89	0.95	1.43
Higher than 12th grade	50.5	49.7	51.9	1.13	1.36	2.00
Income of $5,000 - 9,999						
Education of parent:						
Elementary school	49.1	48.9	49.2	0.86	0.66	1.34
9th - 11th grade	50.1	49.9	50.6	0.49	0.46	0.85
12th grade	50.8	50.8	50.9	0.36	0.47	0.53
Higher than 12th grade	52.0	52.5	50.9	0.57	0.74	0.78
Income of $10,000 or more						
Education of parent:						
Elementary school	50.3	48.3	53.2	0.58	0.60	1.31
9th - 11th grade	51.4	51.2	51.9	0.81	0.96	1.48
12th grade	51.9	51.9	52.0	0.42	0.32	1.31
Higher than 12th grade	52.4	52.5	52.4	0.42	0.52	1.22

Table 7. Average T scores of youths 12-17 years of age on the Goodenough-Harris Drawing Test, by rate of population change, family income, and education of parent, with associated standard errors: United States, 1966-70

Family income and education of parent	Rate of population change									
	Total	Loss	Below average gain	Average gain	Above average gain	Total	Loss	Below average gain	Average gain	Above average gain
	Average T score					Standard error of T score				
All youths, 12-17 years ...	50.0	48.7	50.2	49.4	51.6	0.30	0.81	0.42	0.60	0.42
Family income										
Less than $3,000	46.5	45.5	48.8	45.4	47.4	0.78	1.02	1.17	2.31	1.02
$3,000 - 4,999	48.2	48.7	48.1	46.4	49.5	0.37	0.75	0.76	0.73	1.17
$5,000 - 6,999	49.6	48.7	49.7	49.4	50.7	0.52	1.07	1.15	0.71	0.87
$7,000 - 9,999	51.0	50.7	50.7	50.0	52.3	0.44	0.64	0.55	0.78	0.98
$10,000 - 14,999	51.6	51.0	51.0	51.2	52.5	0.51	1.38	0.71	1.07	0.40
$15,000 or more.....	52.7	50.4	52.7	53.9	52.5	0.61	0.66	1.51	1.33	1.12
Education of parent										
None	43.0	40.9	*	44.5	*	2.03	1.21	...	1.50	...
Less than 5 years	45.4	44.2	48.1	45.9	41.7	0.91	0.69	2.69	1.70	1.02
5 - 7 years.....	47.7	47.6	47.7	46.7	49.6	0.62	0.86	1.53	1.54	0.91
8 years.....	49.0	49.0	48.8	47.0	51.0	0.51	1.30	1.49	1.24	0.43
9 - 11 years.....	49.8	49.3	50.0	49.1	50.8	0.31	0.69	0.39	0.48	0.92
12 years	50.9	49.4	51.4	50.1	52.0	0.39	0.99	0.57	0.55	0.73
13 - 15 years.....	52.0	51.1	51.6	51.7	52.8	0.60	1.49	1.46	1.16	0.99
16 years.....	52.0	50.9	51.3	52.0	52.6	0.45	1.29	1.44	0.72	0.53
17 years or more.....	52.9	51.9	52.8	54.3	52.6	0.40	1.06	1.49	1.43	1.26

Table 8. Average T scores of youths 12-17 years of age on the Goodenough-Harris Drawing Test, by rate of population change, family income, and education of parent, with associated standard errors: United States, 1966-70

Family income and education of parent	Rate of population change									
	Total	Loss	Below average gain	Average gain	Above average gain	Total	Loss	Below average gain	Average gain	Above average gain
	Average T score					Standard error of T score				
All youths, 12-17 years ...	50.0	48.7	50.2	49.4	51.6	0.30	0.81	0.42	0.60	0.42
Income of less than $5,000										
Education of parent:										
Elementary school	46.4	46.2	47.6	44.8	48.1	0.51	0.50	1.33	1.82	0.70
9th - 11th grade	48.4	48.8	48.8	47.6	48.6	0.63	0.94	1.31	1.76	1.51
12th grade	48.6	47.4	49.9	47.9	49.4	0.89	1.75	2.24	1.32	1.67
Higher than 12th grade....	50.5	53.3	49.1	51.5	49.0	1.13	4.10	11.48	3.91	1.01
Income of $5,000 - 9,999										
Education of parent:										
Elementary school	49.1	49.5	47.5	48.8	50.5	0.86	1.53	1.57	1.03	0.99
9th - 11th grade	50.1	49.9	50.3	49.2	51.1	0.49	1.16	0.77	0.82	1.07
12th grade	50.8	49.8	51.8	49.4	51.9	0.36	0.69	0.47	0.80	0.89
Higher than 12th grade....	52.0	50.4	51.7	51.0	53.8	0.57	.128	1.56	1.25	0.75
Income of $10,000 or more										
Education of parent:										
Elementary school	50.3	51.4	50.9	48.7	50.8	0.58	3.03	3.10	1.49	1.31
9th - 11th grade	51.4	48.6	51.1	51.4	53.2	0.81	1.15	1.37	1.06	2.09
12th grade	51.9	50.6	51.2	52.0	53.0	0.42	1.55	0.79	0.78	0.47
Higher than 12th grade....	52.4	51.8	52.1	53.2	52.3	0.42	1.46	1.10	1.33	0.81

Table 9. Average T scores of youths 12-17 years of age on the Goodenough-Harris Drawing Test, by location of household, family income, and education of parent, with associated standard errors: United States, 1966-70

Family income and education of parent	Location of household							
	Total	In central city of SMSA	Not in central city of SMSA	Not in SMSA	Total	In central city of SMSA	Not in central city of SMSA	Not in SMSA
	Average T score				Standard error of T score			
All youths, 12-17 years	50.0	49.7	50.3	49.9	0.30	0.30	0.45	0.53
Family income								
Less than $3,000	46.5	48.0	45.7	45.8	0.78	0.87	2.04	0.81
$3,000 - 4,999	48.2	47.8	47.2	49.0	0.37	0.46	1.07	0.50
$5,000 - 6,999	49.6	49.3	50.0	49.4	0.52	0.72	0.69	1.06
$7,000 - 9,999	51.0	50.1	51.2	51.3	0.44	0.70	0.79	0.57
$10,000 - 14,999	51.6	51.8	51.4	51.6	0.51	0.56	0.89	0.56
$15,000 or more	52.7	51.5	53.1	53.1	0.61	0.66	0.97	1.25
Education of parent								
None	43.0	*	45.8	39.7	2.03	...	2.27	2.00
Less than 5 years	45.4	48.9	43.5	44.3	0.91	1.29	2.01	0.60
5 - 7 years	47.7	47.8	47.1	47.9	0.62	1.13	1.40	0.86
8 years	49.0	47.9	48.6	49.6	0.51	0.93	0.85	0.79
9 - 11 years	49.8	48.9	50.3	50.3	0.31	0.55	0.51	0.53
12 years	50.9	50.5	51.2	50.8	0.39	0.42	0.58	0.73
13 - 15 years	52.0	51.4	52.1	52.2	0.60	1.22	0.89	0.88
16 years	52.0	51.9	52.0	52.1	0.45	0.88	1.12	0.56
17 years or more	52.9	53.0	52.0	54.3	0.40	1.16	0.82	0.74

Table 10. Average T scores of youths 12-17 years of age on the Goodenough-Harris Drawing Test, by location of household, family income, and education of parent, with associated standard errors: United States, 1966-70

Family income and education of parent	Location of household							
	Total	In central city of SMSA	Not in central city of SMSA	Not in SMSA	Total	In central city of SMSA	Not in central city of SMSA	Not in SMSA
	Average T score				Standard error of T score			
All youths, 12-17 years	50.0	49.7	50.3	49.9	0.30	0.30	0.45	0.53
Income of less than $5,000								
Education of parent:								
Elementary school	46.4	47.9	44.4	46.5	0.51	0.96	1.65	0.33
9th - 11th grade	48.4	47.9	48.4	49.2	0.63	1.00	1.58	0.65
12th grade	48.6	48.2	49.4	48.2	0.89	1.31	1.54	1.60
Higher than 12th grade	50.5	48.9	50.3	51.8	1.13	3.76	2.33	1.12
Income of $5,000 - 9,999								
Education of parent:								
Elementary school	49.1	49.3	48.8	49.1	0.86	0.76	0.99	1.57
9th - 11th grade	50.1	49.4	50.0	50.9	0.49	0.62	0.95	0.65
12th grade	50.8	50.0	51.0	51.2	0.36	0.65	0.64	0.51
Higher than 12th grade	52.0	51.1	52.1	52.4	0.57	1.44	1.13	0.39
Income of $10,000 or more								
Education of parent:								
Elementary school	50.3	45.1	50.7	52.2	0.58	2.13	1.15	1.20
9th - 11th grade	51.4	49.9	52.7	51.3	0.81	1.00	0.95	1.81
12th grade	51.9	52.6	51.9	51.4	0.42	0.52	0.71	0.96
Higher than 12th grade	52.4	52.6	52.1	53.0	0.42	0.57	0.65	0.94

Table 11. Average T scores of youths 12-17 years of age on the Goodenough-Harris Drawing Test, by grade level with respect to age, family income, and education of parent, with associated standard errors: United States, 1966-70

Family income and education of parent	Grade level with respect to age							
	Total	Below modal grade	In modal grade	Above modal grade	Total	Below modal grade	In modal grade	Above modal grade
	Average T score				Standard error of T score			
All youths, 12-17 years	50.0	47.9	51.1	52.6	0.30	0.51	0.29	0.62
Family income								
Less than $3,000	46.5	44.5	49.6	48.0	0.78	1.15	0.67	1.97
$3,000 - 4,999	48.2	46.4	49.3	52.5	0.37	0.59	0.54	1.00
$5,000 - 6,999	49.6	48.2	50.7	51.1	0.52	0.75	0.45	1.07
$7,000 - 9,999	51.0	49.0	51.6	53.4	0.44	0.65	0.54	0.72
$10,000 - 14,999	51.6	49.9	51.8	53.7	0.51	0.48	0.43	1.35
$15,000 or more	52.7	52.1	52.5	54.1	0.61	1.60	0.71	0.74
Education of parent								
None	43.0	42.9	45.6	(1)	2.03	3.02	1.51	...
Less than 5 years	45.4	43.5	49.5	48.2	0.91	1.62	0.95	2.34
5 - 7 years	47.7	46.1	49.8	49.3	0.62	0.81	0.59	2.34
8 years	49.0	46.9	50.3	50.9	0.51	0.89	0.66	1.15
9 - 11 years	49.8	48.9	50.3	52.2	0.31	0.33	0.48	1.14
12 years	50.9	49.3	51.3	52.8	0.39	0.82	0.38	0.82
13 - 15 years	52.0	50.5	52.2	54.2	0.60	1.19	0.60	1.29
16 years	52.0	51.3	51.8	54.1	0.45	1.06	0.52	1.39
17 years or more	52.9	49.3	53.5	55.2	0.40	1.10	0.84	1.46

[1] There were no sample persons in this category for whom this information was available.

Table 12. Average T scores of youths 12-17 years of age on the Goodenough-Harris Drawing Test, by grade level with respect to age, family income, and education of parent, with associated standard errors: United States, 1966-70

Family income and education of parent	Grade level with respect to age							
	Total	Below modal grade	In modal grade	Above modal grade	Total	Below modal grade	In modal grade	Above modal grade
	Average T score				Standard error of T score			
All youths, 12-17 years	50.0	47.9	51.1	52.6	0.30	0.51	0.29	0.62
Income of less than $5,000								
Education of parent:								
Elementary school	46.4	44.4	49.2	49.4	0.51	0.79	0.53	1.30
9th - 11th grade	48.4	47.5	49.5	51.9	0.63	0.91	0.78	2.50
12th grade	48.6	45.9	49.5	51.6	0.89	1.28	1.10	2.14
Higher than 12th grade	50.5	53.0	49.9	*	1.13	1.22	1.12	. . .
Income of $5,000 - 9,999								
Education of parent:								
Elementary school	49.1	47.0	50.8	51.3	0.86	1.13	0.76	1.29
9th - 11th grade	50.1	49.6	50.4	51.6	0.49	0.50	0.76	1.11
12th grade	50.8	49.1	51.5	52.5	0.36	0.98	0.50	0.74
Higher than 12th grade	52.0	50.1	52.7	53.2	0.57	0.90	0.73	1.42
Income of $10,000 or more								
Education of parent:								
Elementary school	50.3	49.6	50.5	50.9	0.58	1.88	0.85	2.12
9th - 11th grade	51.4	49.3	52.0	53.0	0.81	1.13	0.98	2.01
12th grade	51.9	51.5	51.7	53.6	0.42	0.74	0.51	1.39
Higher than 12th grade	52.4	50.5	52.5	55.1	0.42	0.96	0.47	1.18

Table 13. Average T scores of youths 12-17 years of age on the Goodenough-Harris Drawing Test, by grade level with respect to age and selected demographic or socioeconomic characteristics, with associated standard errors: United States, 1966-70

Demographic or socioeconomic characteristic	Grade level with respect to age							
	Total	Below modal grade	In modal grade	Above modal grade	Total	Below modal grade	In modal grade	Above modal grade
	Average T score				Standard error of T score			
All youths, 12-17 years	50.0	47.9	51.1	52.6	0.30	0.52	0.27	0.63
Place of residence								
Urbanized areas	50.2	47.9	51.0	52.7	0.33	0.53	0.31	0.66
Urban, other	50.1	48.6	51.4	52.4	0.45	0.99	0.47	1.88
Rural areas	49.6	47.5	51.2	52.2	0.50	0.76	0.54	0.98
Rate of population change								
Loss	48.7	45.8	49.9	51.1	0.82	1.44	0.80	0.97
Below average gain	50.2	49.3	51.1	51.2	0.41	0.54	0.32	0.96
Average gain	49.4	46.6	50.7	52.7	0.65	1.27	0.60	0.94
Above average gain	51.6	49.1	52.4	54.7	0.41	0.72	0.51	1.16
Race								
White	50.6	48.6	51.5	52.7	0.32	0.53	0.33	0.61
Black	46.3	44.3	48.2	50.8	0.71	0.94	0.61	1.53
Geographic region								
Northeast	50.7	47.4	51.3	52.8	0.41	1.29	0.29	0.86
Midwest	50.7	49.2	50.9	53.5	0.71	0.75	0.55	1.08
South	48.5	46.3	51.0	50.1	0.72	0.95	0.58	0.65
West	49.9	48.6	51.3	50.6	0.60	1.27	0.70	2.22
Family income								
Less than $5,000	47.4	45.4	49.5	50.5	0.48	0.66	0.43	0.86
$5,000 - 9,999	50.4	48.6	51.3	52.6	0.38	0.55	0.38	0.55
$10,000 or more	52.0	50.6	52.0	53.9	0.30	0.55	0.36	0.92

Table 14. Percent distribution of youths 12-17 years of age, by type of early school attended and age started first grade, according to selected demographic or socioeconomic characteristics: United States, 1966-70

Demographic or socioeconomic characteristic	Early school attendance					Age started first grade			
	Total	Nursery school and kindergarten	Kindergarten only	Nursery school only	Neither	Total	5 or under	6	7 or over
	Percent distribution								
All youths, 12-17 years	100.0	8.5	57.4	0.8	33.4	100.0	19.9	74.4	5.7
Education of parent									
Elementary school	100.0	3.8	40.6	0.6	55.0	100.0	14.9	74.8	10.3
9th - 11th grade	100.0	5.1	61.2	0.9	32.8	100.0	19.2	75.8	5.0
12th grade	100.0	7.5	66.7	0.9	24.8	100.0	22.4	74.0	3.6
Higher than 12th grade	100.0	19.1	64.4	0.7	15.7	100.0	23.0	74.0	3.1
Family income									
Less than $5,000	100.0	4.8	40.5	0.8	53.9	100.0	14.4	74.9	10.8
$5,000 - 9,999	100.0	5.1	62.4	0.7	31.9	100.0	20.7	75.1	4.3
$10,000 or more	100.0	15.8	65.4	0.9	17.9	100.0	22.7	74.1	3.2
Place of residence									
Urbanized areas	100.0	11.6	66.0	0.9	21.5	100.0	22.7	72.7	4.6
Urban, other	100.0	6.3	57.9	0.6	35.2	100.0	17.2	75.7	7.1
Rural areas	100.0	5.0	45.2	0.6	49.1	100.0	17.2	76.2	6.6
Rate of population change									
Loss	100.0	3.9	44.1	0.3	51.8	100.0	20.0	73.0	7.0
Below average gain	100.0	6.3	61.4	0.6	31.7	100.0	19.2	74.5	6.2
Average gain	100.0	8.6	59.4	0.9	31.1	100.0	19.2	74.9	5.9
Above average gain	100.0	14.3	63.7	1.2	20.8	100.0	21.0	75.0	3.9
Race									
White	100.0	8.8	58.8	0.8	31.6	100.0	20.1	74.3	5.6
Black	100.0	5.9	48.5	0.6	45.1	100.0	18.2	75.5	6.3
Geographic region									
Northeast	100.0	9.0	67.1	0.9	23.0	100.0	27.8	68.6	3.6
Midwest	100.0	7.0	75.3	0.4	17.3	100.0	20.1	76.0	4.0
South	100.0	7.1	23.4	1.3	68.2	100.0	13.0	78.1	8.9
West	100.0	11.0	60.1	0.6	28.3	100.0	19.3	74.2	6.4

Table 15. Average T scores of youths 12-17 years of age on the Goodenough-Harris Drawing Test, by type of early school attended and selected demographic or socioeconomic characteristics, with associated standard errors: United States, 1966-70

Demographic or socioeconomic characteristic	Early school attendance							
	Nursery school and kindergarten	Kindergarten only	Nursery school only	Neither	Nursery school and kindergarten	Kindergarten only	Nursery school only	Neither
	Average T score				Standard error of T score			
All youths, 12-17 years	51.2	50.6	49.7	48.7	0.36	0.33	1.31	0.48
Grade level for age								
Above modal grade	53.3	53.0	*	51.6	1.09	0.76	...	0.77
In modal grade	51.9	51.3	52.5	50.3	0.56	0.30	2.17	0.41
Below modal grade	49.3	48.7	46.4	46.8	0.88	0.57	3.41	0.74
Education of parent								
Elementary school	49.6	49.0	45.8	46.5	1.09	0.57	4.51	0.68
9th - 11th grade	51.9	49.4	48.6	50.2	0.92	0.38	3.13	0.64
12th grade	49.6	51.0	48.6	50.9	1.15	0.39	1.64	0.65
Higher than 12th grade	52.2	52.3	56.6	51.7	0.56	0.50	3.68	0.81
Family income								
Less than $5,000	49.9	48.3	48.5	46.4	1.44	0.43	4.52	0.64
$5,000 - 9,999	51.8	50.5	46.8	50.1	0.60	0.40	1.89	0.55
$10,000 or more	51.3	52.3	53.7	51.1	0.45	0.40	3.09	0.53
Place of residence								
Urbanized areas	51.6	50.4	49.9	49.1	0.47	0.33	2.34	0.72
Urban, other	48.5	50.6	43.0	49.7	0.97	0.48	4.00	0.78
Rural areas	51.1	51.2	51.6	48.1	0.82	0.61	1.16	0.71
Rate of population change								
Loss	49.8	50.0	51.0	47.5	1.10	0.94	2.08	0.84
Below average gain	50.2	50.3	48.4	50.0	1.10	0.47	3.20	1.08
Average gain	51.5	50.1	46.1	47.5	0.96	0.52	4.20	1.22
Above average gain	51.7	51.8	52.2	50.9	0.59	0.47	2.15	0.70
Race								
White	51.5	51.0	50.1	49.5	0.40	0.35	1.61	0.47
Black	47.5	47.7	46.0	44.6	0.91	0.64	9.35	1.14
Geographic region								
Northeast	51.3	50.8	45.5	50.5	0.83	0.50	0.97	0.55
Midwest	51.2	50.7	51.2	51.0	0.35	0.86	3.07	0.81
South	51.7	50.9	51.1	47.3	0.33	0.73	1.99	0.73
West	50.8	50.2	50.9	49.0	1.04	0.48	5.41	1.27

Table 16. Average T scores of youths 12-17 years of age on the Goodenough-Harris Drawing Test, by age the youth started first grade and selected demographic or socioeconomic characteristics, with associated standard errors: United States, 1966-70

Demographic or socioeconomic characteristic	Total	5 years or under	6 years	7 years or over	Total	5 years or under	6 years	7 years or over
	Average T score				Standard error of T score			
All youths, 12-17 years	50.0	50.7	50.0	47.5	0.30	0.39	0.32	0.89
Grade level for age								
Above modal grade	52.6	52.4	52.7	*	0.63	0.60	0.88	...
In modal grade	51.1	51.0	51.1	52.4	0.27	0.49	0.29	1.41
Below modal grade	47.9	47.9	48.2	46.2	0.52	0.68	0.62	0.99
Education of parent								
Elementary school	47.6	48.7	47.7	46.1	0.51	1.00	0.59	1.12
9th - 11th grade	49.8	50.3	49.7	49.1	0.31	0.56	0.37	1.46
12th grade	50.9	50.8	51.0	48.6	0.37	0.40	0.43	1.36
Higher than 12th grade	52.2	52.4	52.2	50.6	0.34	0.74	0.36	4.40
Family income								
Less than $5,000	47.4	48.5	47.4	46.0	0.48	0.81	0.60	1.17
$5,000 - 9,999	50.4	50.8	50.4	49.3	0.37	0.47	0.42	1.17
$10,000 or more	52.0	52.2	52.0	49.8	0.30	0.50	0.32	2.20
Place of residence								
Urbanized areas	50.2	50.7	50.2	49.1	0.33	0.54	0.33	1.51
Urban, other	50.1	50.9	50.3	47.2	0.45	0.62	0.53	2.57
Rural areas	49.6	50.6	49.8	46.1	0.50	0.58	0.52	1.07
Rate of population change								
Loss	48.7	49.1	49.0	44.6	0.82	0.78	0.83	1.46
Below average gain	50.2	51.0	50.1	49.7	0.41	0.53	0.51	1.93
Average gain	49.4	50.8	49.2	46.7	0.65	1.17	0.77	0.53
Above average gain	51.6	51.8	51.6	49.9	0.41	0.46	0.45	1.60
Race								
White	50.6	51.1	50.6	48.2	0.32	0.35	0.31	1.01
Black	46.3	47.7	46.2	43.5	0.71	1.36	0.88	1.49
Geographic region								
Northeast	50.7	50.8	50.9	47.1	0.39	0.97	0.26	1.27
Midwest	50.7	51.1	50.8	48.5	0.72	0.38	0.80	2.65
South	48.5	50.5	48.5	46.1	0.73	0.71	0.80	0.87
West	49.9	50.3	50.0	48.8	0.60	0.79	0.56	3.37

Table 17. Average T scores of youths 12-17 years of age on the Goodenough-Harris Drawing Test, by race, family income, and education of parent, with associated standard errors: United States, 1966-70

Family income and education of parent	Total[1]	White	Black	Total[1]	White	Black
	Average T score			Standard error of T score		
All youths, 12-17 years	50.0	50.6	46.3	0.30	0.32	0.73
Family income						
Less than $3,000	46.5	47.4	44.8	0.78	0.73	1.35
$3,000 - 4,999	48.2	48.9	46.3	0.37	0.42	0.72
$5,000 - 6,999	49.6	50.0	46.8	0.52	0.56	0.83
$7,000 - 9,999	51.0	51.1	50.0	0.44	0.44	1.71
$10,000 - 14,999	51.6	51.8	46.7	0.51	0.53	2.23
$15,000 or more	52.7	52.6	51.5	0.61	0.63	2.33
Education of parent						
None	43.0	43.2	42.1	2.03	2.54	1.72
Less than 5 years	45.4	46.8	42.8	0.91	1.02	0.98
5 - 7 years	47.7	49.3	43.9	0.62	0.55	1.05
8 years	49.0	49.4	45.1	0.51	0.53	1.52
9 - 11 years	49.8	50.3	47.9	0.31	0.36	0.88
12 years	50.9	51.0	49.0	0.39	0.37	1.38
13 - 15 years	52.0	52.1	48.7	0.60	0.61	1.34
16 years	52.0	52.2	42.7	0.45	0.47	1.89
17 years or more	52.9	52.7	56.3	0.40	0.41	13.17

[1] Data on youths whose race was reported as other than white or black are included in the totals. Separate scores are not shown for this group because the number in the sample was too small to provide reliable estimates for the various subgroups. The overall score for the group of youths in the "other" category was 49.8 and the standard error of the estimate was 2.41.

Table 18. Average T scores of youths 12-17 years of age on the Goodenough-Harris Drawing Test, by race, family income, and education of parent, with associated standard errors: United States, 1966-70

Family income and education of parent	Total[1]	White	Black	Total[1]	White	Black
	Average T score			Standard error of T score		
All youths, 12-17 years of age	50.0	50.6	46.3	0.30	0.32	0.73
Income of less than $5,000						
Education of parent:						
Elementary school	46.4	47.5	43.8	0.51	0.31	1.25
9th - 11th grade	48.4	49.0	47.4	0.63	0.61	1.16
12th grade	48.6	48.7	48.2	0.89	1.01	1.59
Higher than 12th grade	50.5	51.9	46.2	1.13	0.88	2.68
Income of $5,000 - 9,999						
Education of parent:						
Elementary school	49.1	49.6	45.4	0.86	0.98	0.88
9th - 11th grade	50.1	50.4	48.3	0.49	0.54	1.34
12th grade	50.8	50.9	50.0	0.36	0.34	1.95
Higher than 12th grade	52.0	52.0	50.6	0.57	0.60	2.70
Income of $10,000 or more						
Education of parent:						
Elementary school	50.3	51.2	40.2	0.58	0.81	3.20
9th - 11th grade	51.4	51.4	*	0.81	0.76	...
12th grade	51.9	52.0	50.0	0.42	0.43	2.42
Higher than 12th grade	52.4	52.5	48.7	0.42	0.41	3.31

[1] Data on youths whose race was reported as other than white or black are included in the totals. Separate scores are not shown for this group because the number in the sample was too small to provide reliable estimates for the various subgroups. The overall score for the group of youths in the "other" category was 49.8 and the standard error of the estimate was 2.41.

APPENDIXES

CONTENTS

I. Technical Notes 32
The Survey Design 32
Reliability 33
Missing Test Results and Imputation Procedures 34
Sampling and Measurement Error 35
Hypothesis Testing 35
Small Categories 35
Standard Scores 35

II. Demographic and Socioeconomic Variables and Related Terms 42

LIST OF APPENDIX TABLES

I. T score equivalents of raw scores of boys 12-17 years of age on the Goodenough-Harris man scale (person drawing), by age: United States, 1966-70 36

II. T Score equivalents of raw scores of girls 12-17 years of age on the Goodenough-Harris man scale (person drawing), by age: United States, 1966-70 37

III. T score equivalents of raw scores of boys 12-17 years of age on the Goodenough-Harris woman scale (person drawing), by age: United States, 1966-70 38

IV. T score equivalents of raw scores of girls 12-17 years of age on the Goodenough-Harris woman scale (person drawing), by age: United States, 1966-70 39

V. Percent distributions of youths 12-17 years of age in the U.S. population, by race and geographic region and by family income and education of parent, according to race and geographic region: United States, 1966-70 40

VI. Percent distributions of youths 12-17 years of age in the U.S. population, by race and place of residence and by family income and education of parent, according to race and place of residence: United States, 1966-70 41

APPENDIX I

TECHNICAL NOTES

The Survey Design

The sample design for each of the first three programs of the Health Examination Survey (Cycles I-III) has been essentially similar in that it has been a multistage, stratified probability sample of clusters of households in land-based segments. The successive elements were the primary sample unit (PSU), census enumeration district (ED), segment (a cluster of households), household, eligible youths, and finally, the sample youth.

The 40 sample areas and the segments utilized in the design of Cycle III were the same as those in Cycle III. Previous reports describe in detail the sample design used for Cycle II, and, in addition, discuss the problems and considerations given to other types of sampling frames and whether or not to control the selection of siblings. [4,8]

Requirements and limitations placed on the design for Cycle III, similar to those for the design in Cycle II, were as follows:

The target population was defined as the civilian noninstitutionalized population of the United States, including Alaska and Hawaii, in the age range of 12-17 years, with the special exclusion of children residing on reservation lands of the American Indians. The latter exclusion was adopted as a result of operational problems encountered on these lands in Cycle I.

The time period of data collection was limited to about 3 years, and the length of the individual examination within the specially constructed mobile examination center to between 2 and 3 hours.

Ancillary data were collected on specially designed household, medical history, and school questionnaires and from copies of birth certificates.

Examination objectives were related primarily to factors of physical and intellectual growth and development.

The sample was sufficiently large to yield reliable findings within broad geographic regions and population density groups as well as within age, sex, and limited socioeconomic groups for the total sample.

The sample was drawn jointly with the U.S. Bureau of the Census, beginning with the 1960 Decennial Census list of addresses and the nearly 1,900 PSU's into which the entire United States was divided. Each PSU is either a standard metropolitan statistical area (SMSA), a county, or a group of two or three contiguous counties. These PSU's were grouped into 40 strata so that each stratum had an average size of about 4.5 million persons. Grouping was also done to maximize the degree of homogeneity within strata with regard to the population size of the PSU's, degree of urbanization, geographic proximity, and degree of industrialization. The 40 strata were then classified into four broad geographic regions of 10 strata each and then cross-classified within each region by four population density classes and classes of rate of population change from 1950 to 1960. Using a modified Goodman-Kish controlled-selection technique, one PSU was drawn from each of the 40 strata.

Generally, within each PSU, 20 ED's were selected, with the probability of selection of a particular ED proportional to its population in the age group 5-9 years in the 1960 census, which by 1966 approximated the target population for Cycle III. A similar method was used for selecting

one segment (a smaller cluster of households) in each ED. Because of the approximately 3-year interval between Cycle II and Cycle III, the Cycle III sampling frame was updated for new construction and to compensate for segments where housing was partially or totally demolished to make room for highway construction or urban redevelopment. Each of the resulting 20 segments within a PSU was either a bounded area or a cluster of households (or addresses). All youths in the appropriate age range who resided at the address visited were eligible youths, i.e., eligible for inclusion in the sample. Operational considerations made it necessary to reduce the number of prospective examinees at any one location to a maximum of 200. When the number of eligible youths in a particular location exceeded this number, the "excess" eligible youths were deleted from the sample through a systematic sampling technique. Youths who were not selected as sample youths in the Cycle III sample, but who were previously examined in Cycle II, were scheduled for examination if time permitted and will be included in special longitudinal analyses. In addition, individual twins who were deleted from the Cycle III sample were also scheduled for examination, as they had been in Cycle II, to provide data on pairs of twins for future analysis. These data are not included in this report as part of the national probability sample of youths.

The sample was selected in Cycle III, as it had been for the children in Cycle II, to contain proportional representation of youths from families having only one eligible youth, two eligible youths, and so on, so as to be representative of the total target population. However, since households were one of the elements in the sample frame, the number of related youths in the resulting sample is greater than that which would result from a design which sampled youths aged 12-17 years without regard to household. The resulting estimated mean measurements or rates should be unbiased, but their sampling variability will be somewhat greater than those from a more costly, time-consuming, systematic sample design in which every k^{th} youth would be selected.

The total probability sample for Cycle III included 7,514 youths representative of the approximately 22.7 million noninstitutionalized U.S. youths aged 12-17 years. The sample contained approximately 1,000 youths in each single year of age who were drawn from 25 different States.

The response rate in Cycle III was 90 percent, with 6,768 youths examined out of the total sample. These examinees were closely representative of those in the population from which the sample was drawn with respect to age, sex, race, geographic region, and population density and growth in area of residence. Hence it appears unlikely that nonresponse could bias the findings appreciably.

Estimated distributions by geographic region and by type of area, i.e., urban versus rural, according to family income and first listed parent's level of education, are shown in tables V and VI.

Reliability

While measurement processes in the surveys were carefully standardized and closely controlled, the correspondence between true population figures and survey results cannot be expected to be exact. Survey data are imperfect for three major reasons: (1) results are subject to sampling error, (2) the actual conduct of a survey never agrees perfectly with the design, and (3) the measurement processes themselves are inexact even though standardized and controlled.

General methods used to control the quality of the data from this survey have been discussed previously,[9] and some remarks relating specifically to the human figure drawing test can be found in the text of this report. As indicated, quality control methods included two independent scorings of each drawing by two adults who were carefully trained in the Goodenough-Harris scoring methods, and a high level of agreement was realized between the two sets of scores.

An additional exploration of consistency in scoring on the Goodenough-Harris scales was undertaken during the Cycle III program. One hundred and forty man drawings and 84 woman drawings selected from 11 of the first 19 sampling areas were rescored under the direct supervision of Dale Harris, author of the Goodenough-Harris Drawing Test scoring standards. These 224 drawings fell into three groups representing different teams of scorers used in the Health Examination Survey study. Two persons rescored the tests in-

dependently. Any differences between the scoring were reconciled in conference before a score was reported.

The correlation between these scores and the survey scores was about 0.9, which provided additional evidence of interscorer consistency.

Data recorded for each sample youth are inflated in the estimation process to characterize the larger universe of which the sample youth is representative. The weights used in this inflation process are a product of the reciprocal of the probability of selecting the youth, an adjustment for nonresponse cases, and a poststratified ratio adjustment which increases precision by bringing survey results into closer alignment with known U.S. population figures by color and sex within single years of age 12-17.

In the third cycle of the Health Examination Survey (as for the children in Cycle II) the sample was the result of three principal stages of selection—the single PSU from each stratum, the 20 segments from each sample PSU, and the sample youth from the eligible youths. The probability of selecting an individual youth is the product of the probability of selection at each stage.

Because the strata are roughly equal in population size and a nearly equal number of sample youths were examined in each of the sample PSU's, the sample design is essentially self-weighting with respect to the target population; that is, each youth aged 12-17 years had about the same probability of being drawn into the sample.

The adjustment upward for nonresponse is intended to minimize the impact of nonresponse on final estimates by imputing to nonrespondents the characteristics of "similar" respondents. "Similar" respondents in a sample PSU are defined here as examined youths of the same age in years and of the same sex as youths not examined in that sample PSU.

The poststratified ratio adjustment used in the third cycle achieved most of the gains in precision which would have been attained if the sample had been drawn from a population stratified by age, color, and sex. This adjustment made the final sample estimates of population agree exactly with independent controls prepared by the U.S. Bureau of the Census for the noninstitutionalized population as of March 9, 1968 (approximate midsurvey point for Cycle III) by race and sex for each single year of age 12-17. The weight of every responding sample youth in each of the 24 age, race, and sex classes is adjusted upward or downward so that the weighted total within the class equals the independent population control.

Missing Test Results and Imputation Procedures

In addition to youths who were selected for the sample but not examined, there were some whose examination was incomplete in one procedure or another. Of the total 6,768 youths examined, 536 had either the person drawing, the self drawing, or both drawings missing or not adequately completed for scoring. Of these 536 cases, 504 were determined to be incomplete because of factors not directly attributable to the sample youth, such as inadequate time for completion of drawing, records lost in shipping, and examiner's errors in administration. Only 32 cases were determined to be incomplete because of some characteristic of the youth being examined, such as atypical behavior, sensory-motor defects, or language problems. Since the reason for incomplete test results in most cases was not directly related to the characteristic being measured, raw scores were imputed for almost all of these examinees. In the 32 cases where some problem of the youth was documented, imputation was not considered appropriate.

Imputation was accomplished in the following manner: An intercorrelation matrix of all psychological test data and selected socioeconomic variables was derived to identify those variables which were most highly associated with each raw test score. As a result, five variables were chosen for the imputation of Goodenough-Harris raw scores—other available test scores, level of education of the head of the household (four categories), age, and two control variables, race and sex. Imputation of a missing test result for an examinee was accomplished by randomly selecting a match among the group of examinees of the same age in years, parental level of education, race, sex, and available raw score test results most highly correlated with the scores to

be imputed. The raw score of this "matched" examinee was then imputed to the examinee with the missing score. When data for any of these variables were not available, a match was selected using information on the variables available in the youth's record.

Sampling and Measurement Error

In the present report, reference has been made to efforts to minimize bias and variability of measurement techniques. The probability design of the survey makes possible the calculation of sampling errors. The sampling error is used here to determine how imprecise the survey test results may be because they result from a sample rather than from the measurement of all elements in the universe. The estimation of sampling errors for a study of the type of the Health Examination Survey is difficult for at least three reasons: (1) measurement error and "pure" sampling error are confounded in the data, and it is difficult to find a procedure that will either completely include both or treat one or the other separately; (2) the survey design and estimation procedure are complex and accordingly require computationally involved techniques for the calculation of variances; and (3) thousands of statistics are derived from the survey, many for subclasses of the population for which there are a small number of cases. Estimates of sampling error are obtained from the sample data and are themselves subject to sampling error, which may be large when the number of cases in a cell is small or, occasionally, even when the number of cases is substantial.

Estimates of the approximate sampling variability for selected statistics used in this report are presented alongside the statistics in the detailed tables. These estimates, called "standard errors," have been prepared by a replication technique that yields overall variability through observation of variability among random subsamples of the total sample. The method reflects both "pure" sampling variance and a part of the measurement variance and is described in previously published reports.[10,11]

Hypothesis Testing

In accordance with usual practice, the interval estimate for any statistic may be considered the range within one standard error of the tabulated statistic with 68-percent confidence or the range within two standard errors of the tabulated statistics with 95-percent confidence.

An approximation of the standard error of a difference $d = x - y$ of two statistics x and y is given by the formula $S_d = (S_x^2 + S_y^2)^{1/2}$ where S_x and S_y are the sampling errors, respectively, of x and y. Of course, where the two groups of measures are positively or negatively correlated, this formula will give an overestimate or underestimate of the actual standard error.

Small Categories

In some tables estimates have not been shown for certain categories for which the sample size was so small that the relative standard error exceeded 0.25. A few estimates which did not meet this strict standard of precision have been included along with their corresponding standard errors in the belief that the information may add to the overall impression of the survey findings and therefore may be of interest to subject-matter specialists.

Standard Scores

For each type of figure drawing the raw scores were converted by means of the cumulative percentage distributions to normalized T scores with a mean of 50 and a standard deviation of 10. This was done within each single age group for males and females separately. Since raw scores on the Goodenough-Harris Test were found to level off after age 15, the age groups 15-17 years were combined. Slight irregularities in the progression of scaled score equivalents from age to age were encountered during the standardization process, primarily in the man drawing by females and the woman drawing by males. These irregularities, assumed to be due to sampling variability, were found at the extremes of the distributions and were eliminated by a graphic smoothing procedure. The final conversions are shown in tables I-IV.

Table I. T score equivalents of raw scores of boys 12-17 years of age on the Goodenough-Harris man scale (person drawing), by age: United States, 1966-70

T score	Age (in years)				T score	Age (in years)			
	12	13	14	15-17		12	13	14	15-17
	Raw score					Raw score			
75	55-71	55-71	56-71	59-71	49	33	35	37	39
74	54	54		58	48		34		
73	53	53	55	57	47	32	33	36	38
72	52	52		56	46		32	35	37
71	51	51	54		45	31		34	46
70				55	44	30	31	33	35
69	50	50	53	54	43	29	30	32	34
68	49	49	52	53	42		29	31	33
67	48	48	51	52	41		28		32
66	47	47	50	51	40	28	27	30	31
65	46		49	50	39	27		29	30
64	45	46	48	49	38		26	28	29
63	44	45			37	26	25	27	28
62	43		47	48	36	25		26	27
61	42	44	46	47	35		24		26
60					34	24	23	25	25
59	41	43	45	46	33	23		24	24
58	40	42	44	45	32		22	23	23
57		41	43		31	22		22	22
56	39	40		44	30	21	21	21	21
55	38		42	43	29	20	20	20	20
54	37	39	41		28	19	19	19	19
53	36	38	40	42	27	18	18	18	18
52		37		41	26	17	17	17	17
51	35	36	39	40	25	0-16	0-16	0-16	0-16
50	34		38						

Table II. T score equivalents of raw scores of girls 12-17 years of age on the Goodenough-Harris man scale (person drawing), by age: United States, 1966-70

T score	Age (in years)				T score	Age (in years)			
	12	13	14	15-17		12	13	14	15-17
	Raw score					Raw score			
75	53-71	53-71	55-71	56-71	49		35	36	38
74	52	52	54		48	34			37
73	51	51	53	55	47			35	36
72	50	50	52	54	46	33	34		35
71	49			53	45			34	34
70	48	49	51	52	44	32	33		
69	47	48	50		43	31	32	33	33
68			49	51	42	30	31	32	
67	46			50	41	29	30	31	32
66		47	48	49	40	28	29	30	31
65			47		39	27	28		
64	45	46		48	38	26	27	29	30
63	44	45		47	37	25	26		29
62	43		46		36	24	25	28	28
61		44		46	35	23	24	27	27
60	42	43	45		34		23	26	26
59	41	42	45	45	33	22	22		
58	40	41		44	32	21	21	25	25
57	39		43		31	20	20	24	24
56	38	40	42	43	30	19	19	23	23
55		39	41	42	29	18	18	22	22
54	37	38			28	17	17	21	21
53	36		40	41	27			20	20
52		37	39	40	26			19	19
51	35		38		25	0-16	0-16	0-18	0-18
50		36	37	39					

Table III. T score equivalents of raw scores of boys 12-17 years of age on the Goodenough-Harris woman scale (person drawing), by age: United States, 1966-70

T score	Age (in years)				T score	Age (in years)			
	12	13	14	15-17		12	13	14	15-17
	Raw score					Raw score			
75	49-73	51-73	54-73	54-73	49	30		33	35
74		50	53	53	48	29	30		34
73	48	49	52	52	47	28	29	32	33
72		48	51	51	46		28	31	32
71	47	47	50	50	45	27		30	31
70				49	44		27	29	30
69	46	46	49		43	26			29
68			48	48	42		26	28	28
67	45	45	47		41	25			
66	44		46	47	40		25	27	27
65		44			39	24		26	26
64	43	43	45	46	38	23	24	25	25
63	42	42	44	45	37	22	23	24	
62	41			44	36	21	22		24
61	40	41	43		35		21	23	
60	39		42	43	34	20			23
59	38	40		42	33		20	22	22
58		39	41	41	32				
57	37	38	40		31	19	19	21	21
56		37	39	40	30				
55	36	36	38		29	18	18	20	20
54	35	35		39	28				
53	34	34	37	38	27			19	
52	33	33	36	37	26			18	
51	32	32	35		25	0-17	0-17	0-17	0-19
50	31	31	34	36					

Table IV. T score equivalents of raw scores of girls 12-17 years of age on the Goodenough-Harris woman scale (person drawing), by age: United States, 1966-70

T score	Age (in years)				T score	Age (in years)			
	12	13	14	15-17		12	13	14	15-17
	Raw score					Raw score			
75	53-73	56-73	58-73	59-73	49			39	
74			57	58	48	36	37		39
73	52			57	47	35	36	38	38
72	51	55	56	56	46	34	35	37	37
71	50	54			45	33		36	36
70			55	55	44		34		
69	49	53	54	54	43	32	33	35	
68	48	52	53	53	42			34	35
67	47	51	52	52	41	31	32	33	34
66		50	51		40	30	31		33
65				51	39	29	30	32	
64	46	49	50	50	38		29	31	32
63		48	49	49	37	28		30	31
62	45		48	48	36	27	28		30
61		47			35		27	29	29
60	44	46	47	47	34		26	28	28
59		45	46	46	33	26	25	27	27
58	43		45	45	32	25	24	26	26
57		44	44		31	24	23	25	25
56	42	43		44	30	23	22	24	24
55	41	42	43		29	22	21	23	23
54	40	41	42	43	28	21		22	22
53	39			42	27	20	20	21	21
52		40	41		26	19	19	20	20
51	38	39		41	25	0-18	0-18	0-19	0-19
50	37	38	40	40					

Table V. Percent distributions of youths 12-17 years of age in the U.S. population, by race and geographic region and by family income and education of parent, according to race and geographic region: United States, 1966-70

[Based on HES sample]

Family income and education of parent	White					Black				
	Total	North-east	Mid-west	South	West	Total	North-east	Mid-west	South	West
	Percent distribution									
Total U.S. population	100.0	22.4	30.3	20.0	27.3	100.0	21.4	17.3	47.8	13.4
Family income										
Total	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0
Less than $5,000	20.1	12.8	12.6	35.8	22.8	59.1	48.0	40.5	75.2	43.5
$5,000 - 9,999	40.0	43.4	43.3	34.0	37.9	27.5	34.9	38.1	18.1	35.4
$10,000 or more	33.4	35.4	39.8	25.7	30.7	6.8	4.3	17.9	1.6	14.8
Unknown	6.5	8.5	4.3	4.4	8.6	6.7	12.7	3.5	5.1	6.3
Education of parent										
Total	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0
Elementary school	25.2	18.9	21.2	39.4	24.6	43.2	30.7	28.0	58.3	29.2
9th - 11th grade	18.8	21.8	20.3	16.8	16.2	28.2	35.9	28.3	22.4	36.1
12th grade	29.9	33.8	34.0	20.1	29.2	16.8	19.9	28.2	9.8	22.0
Higher than 12th grade	23.9	24.0	23.1	21.5	26.4	6.0	5.8	8.2	3.8	11.5
Unknown	2.2	1.5	1.4	2.3	3.6	5.8	7.6	7.1	5.8	1.2

Table VI. Percent distributions of youths 12-17 years of age in the U.S. population, by race and place of residence and by family income and education of parent, according to race and place of residence: United States, 1966-70

[Based on HES sample]

Family income and education of parent	White			Black		
	Total	Urban	Rural	Total	Urban	Rural
	Percent distribution					
Total U.S. population	100.0	61.4	38.6	100.0	78.3	21.7
Family income						
Total	100.0	100.0	100.0	100.0	100.0	100.0
Less than $5,000	20.1	16.2	26.2	59.1	56.1	69.9
$5,000 - 9,999	40.0	41.1	38.1	27.5	29.9	18.9
$10,000 or more	33.4	37.3	27.3	6.8	8.0	2.4
Unknown	6.5	5.4	8.3	6.7	6.1	8.9
Education of parent						
Total	100.0	100.0	100.0	100.0	100.0	100.0
Elementary school	25.2	19.5	34.3	43.2	38.0	61.9
9th - 11th grade	18.8	19.7	17.5	28.2	31.0	18.1
12th grade	29.9	32.6	25.4	16.8	19.2	8.1
Higher than 12th grade	23.9	26.3	20.1	6.0	7.3	1.3
Unknown	2.2	1.9	2.7	5.8	4.5	10.6

APPENDIX II

DEMOGRAPHIC AND SOCIOECONOMIC VARIABLES AND RELATED TERMS

Age.—The age recorded for each youth was age at last birthday as of the date of examination. Age was confirmed by comparison with the date of birth on the youth's birth certificate. The age criterion for inclusion in the sample was the age at the time of the first interview. Since the examination usually took place 2 to 4 weeks after the interview, some youths who were 17 years old at the time of interview became 18 years old by the time of examination. There were 58 such cases. In the adjustment and weighting procedures and in the analysis, these youths were included in the 17-year-old group.

Grade.—The grade placement of sample youths was obtained from the questionnaire sent to the schools they attended. If educational level was not available from the school questionnaire, grade placement or the fact of having completed or left school was determined from information noted by examiners on one of the psychological test record forms. For youths on summer vacation, the grade placement recorded was the grade the youth would enter in the fall. Those included in the "more than high school education" category are youths who were enrolled in colleges or training programs beyond high school level or youths on summer vacation after high school graduation who planned to continue their education in the fall.

Race.—Race was recorded as "white," "Negro," or "other." The last category included American Indians, Chinese, Japanese, and all races other than white or Negro. Mexican persons were included with "white" unless definitely known to be American Indian or of another race. Negroes and persons of mixed Negro and other parentage were recorded as "Negro." The term "Negro" has been replaced by "black" in this report. Adolescents recorded as "other" comprised less than 1 percent of the sample and were excluded from the detailed presentations.

Geographic region.—For purposes of stratification, the United States was divided into four broad geographic regions of approximately equal population. These regions, which correspond closely to those used by the U.S. Bureau of the Census, were as follows:

Region	*States Included*
Northeast	Maine, Vermont, New Hampshire, Massachusetts, Connecticut, Rhode Island, New York, New Jersey, and Pennsylvania.
Midwest	Ohio, Illinois, Indiana, Michigan, Wisconsin, Minnesota, Iowa, and Missouri.
South	Delaware, Maryland, District of Columbia, West Virginia, Virginia, Kentucky, Tennessee, North Carolina, South Carolina, Georgia, Florida, Alabama, Mississippi, Louisiana, and Arkansas.
West	Washington, Oregon, California, Nevada, New Mexico, Arizona, Texas, Oklahoma, Kansas, Nebraska, North Dakota, South Dakota, Idaho, Utah, Colorado, Montana, Wyoming, Alaska, and Hawaii.

Education of parent or guardian.—The highest grade completed in school was recorded. The only grades counted were those attended in a regular public or private school where persons were given formal education, whether during the day or at night and whether attendance was full or part time. A "regular" school is one which advances a person toward an elementary or high school diploma, or a college, university, or professional school degree. Education in vocational, trade, or business schools outside the regular school system was not counted in determining the highest grade of school completed.

Family income.—The income recorded was the total income received during the past 12 months by the head of the household and all other household members related to the head by blood, marriage, or adoption. This income was the gross cash income (excluding pay in kind) except in the case of a family with its own farm or business, in which case net income was recorded.

Parent.—A parent was the natural parent or, in the case of adoption, the legal parent of the child.

Guardian.—A guardian was responsible for the care and supervision of the child. He (or she) did not have to be the legal guardian to be considered the guardian for this survey. A guardianship could only exist when the parent(s) of the child did not reside within the sample household.

Head of household.—Only one person in each household was designated as the "head." He (or she) was the person who was regarded as the "head" by the members of the household. In most cases the head was the chief breadwinner of the family, although this was not always true. In some cases the head was the parent of the chief earner or the only adult member of the household.

○○○

☆U.S. GOVERNMENT PRINTING OFFICE: 1977—241-180:10

VITAL AND HEALTH STATISTICS PUBLICATIONS SERIES

Formerly Public Health Service Publication No. 1000

Series 1. Programs and Collection Procedures.—Reports which describe the general programs of the National Center for Health Statistics and its offices and divisions, data collection methods used, definitions, and other material necessary for understanding the data.

Series 2. Data Evaluation and Methods Research.—Studies of new statistical methodology including experimental tests of new survey methods, studies of vital statistics collection methods, new analytical techniques, objective evaluations of reliability of collected data, contributions to statistical theory.

Series 3. Analytical Studies.—Reports presenting analytical or interpretive studies based on vital and health statistics, carrying the analysis further than the expository types of reports in the other series.

Series 4. Documents and Committee Reports.—Final reports of major committees concerned with vital and health statistics, and documents such as recommended model vital registration laws and revised birth and death certificates.

Series 10. Data from the Health Interview Survey.—Statistics on illness; accidental injuries; disability; use of hospital, medical, dental, and other services; and other health-related topics, based on data collected in a continuing national household interview survey.

Series 11. Data from the Health Examination Survey.—Data from direct examination, testing, and measurement of national samples of the civilian, noninstitutionalized population provide the basis for two types of reports: (1) estimates of the medically defined prevalence of specific diseases in the United States and the distributions of the population with respect to physical, physiological, and psychological characteristics; and (2) analysis of relationships among the various measurements without reference to an explicit finite universe of persons.

Series 12. Data from the Institutionalized Population Surveys.—Discontinued effective 1975. Future reports from these surveys will be in Series 13.

Series 13. Data on Health Resources Utilization.—Statistics on the utilization of health manpower and facilities providing long-term care, ambulatory care, hospital care, and family planning services.

Series 14. Data on Health Resources: Manpower and Facilities.—Statistics on the numbers, geographic distribution, and characteristics of health resources including physicians, dentists, nurses, other health occupations, hospitals, nursing homes, and outpatient facilities.

Series 20. Data on Mortality.—Various statistics on mortality other than as included in regular annual or monthly reports. Special analyses by cause of death, age, and other demographic variables; geographic and time series analyses; and statistics on characteristics of deaths not available from the vital records, based on sample surveys of those records.

Series 21. Data on Natality, Marriage, and Divorce.—Various statistics on natality, marriage, and divorce other than as included in regular annual or monthly reports. Special analyses by demographic variables; geographic and time series analyses; studies of fertility; and statistics on characteristics of births not available from the vital records, based on sample surveys of those records.

Series 22. Data from the National Mortality and Natality Surveys.—Discontinued effective 1975. Future reports from these sample surveys based on vital records will be included in Series 20 and 21, respectively.

Series 23. Data from the National Survey of Family Growth.—Statistics on fertility, family formation and dissolution, family planning, and related maternal and infant health topics derived from a biennial survey of a nationwide probability sample of ever-married women 15-44 years of age.

For a list of titles of reports published in these series, write to:

Scientific and Technical Information Branch
National Center for Health Statistics
Public Health Service, HRA
Rockville, Md. 20857

DHEW Publication No. (HRA) 77-1641
Series 11 - No. 159

NCHS